TECHNOLOGY PERSPECTIVE CAPABILITY ROADMAP

TPCR 2025

PREFACE

1. Technology has always been used to produce improved tools of warfare. The present day is unfolding an unprecedented revolution in technologies. These technologies have ushered in the advent of offensive cyber operations, autonomous unmanned systems, information dominance, space wars and such like that have culminated in Effect Based Operations (EBOs). Rapid advances & convergence in fields such as robotics, artificial intelligence & information technology will continue to have a revolutionary impact on the battlefield of the future.

2. Induction of new weapon systems is cost intensive. Building complex platforms has long lead time which is constantly challenged by the necessity to keep pace with the relentless march of technology. Towards this, it becomes operationally essential that technological drivers are integrated into the roadmap for the Armed Forces at the conceptual stage itself to enable building of capabilities in a viable time frame. As an adjunct to the Integrated Capability Development System, the Technology Perspective Capability Roadmap (TPCR) seeks to fulfill this obligation. TPCR as a document seeks to reach out to the Industry and convey the Services' perspective on emerging futuristic combat technologies and their stated requirements in enhancing warfighting capabilities. This will enable our private industry to step up R&D efforts, build production lines & assemblies to meet the requirements in a desired timeframe.

3. As a follow on document to the two preceding editions of TPCR 2013 & 2018, the current edition encompasses multiple domains of technology including the futuristic ones based on the key requirements of the Services. The domain specific needs of the Services – Land Based, Aviation, Maritime & Joint technologies are dwelt upon in great detail akin to the 2018 edition in a similar format. During this intervening period, a lot of emphasis has been placed upon indigenization of home grown technologies as also the public private sector partnership through various forms such as iDEX, Make and TDF. To further the policy on indigenisation, the Government has opened a dedicated portal named Srijan which houses the requirements of the Services with regards to indigenising their equipment. Futuristic combat technologies are forecasted through a bi-annual tech bulletin named Triveni released by HQ IDS that conveys the Services' perspective.

4. The cardinal need to embrace self-reliance (Atmanirbharata) along all stages of design and development cannot be further stressed upon. The Defence Acquisition Procedure (DAP) 2020 has been a seminal document in guiding the Industry on the complexities of Defence acquisitions. Further, the amended version of the Defence Procurement Manual (DPM) 2009 is in its final stages of approval and is expected to be released by the year end. With adequate emphasis on indigenization, the new DPM will further simplify procurement policies & procedures.

5. As the nation stands on the threshold of embracing greater challenges and responsibilities in the forthcoming decades, it is but imperative that the Services be equipped accordingly. Greater private-public sector partnership is thus the road ahead. Towards this, the TPCR 2025 document is a step in the right direction with its well articulated contents realising the twin aims of Indigenisation and Modernisation in the desired timeframe.

PREAMBLE

1. The Technology Perspective and Capability Roadmap (TPCR) offers the industry an insight into the Armed Forces' future capability requirements for the next 15 years, influencing technology development. Till date two TPCRs have been published viz TPCR-2013 and TPCR-2018. In April 2013, the TPCR's inaugural edition was released. The second edition of TPCR was released in Apr 2018, based on feedback received from business associations and the industry to improve the document's educational value for prospective manufacturers. As per the feedback received from the stakeholders, many AONs and contracts have been fructified from TPCR-2018.

2. As per para 25(a) of DAP-2020, HQ IDS prepares a 10-year ICDP in consultation with the SHQ, every (five years), comprising of two five-year plans. This is prepared, along with a Technology Perspective and Capability Roadmap (TPCR) reflecting the details of technologies and capabilities that could be made public for use by the industry.

3. The industry is given an overview of the equipment that is anticipated to be incorporated into the Indian Armed Forces through the end of the 2030s by the Technology Perspective and Capability Roadmap – 2025 (TPCR-2025). The goal of this document is to direct the industry's potential path towards technological growth. The industry may use this roadmap as a guidance when organizing or starting partnerships, production agreements, and technology development.

4. The Indian industry should prioritize the government's "*Make-in-India*" initiative while pursuing any partnerships or developments. The Ministry of Defense is dedicated to supporting the government's efforts to build up domestic production capacity in both the public and private sectors. The military services of our country are also encouraging MSMEs to participate in their "*Make-in-India*" campaigns.

5. As a result, this edition of the TPCR has a structure with content that has the inclusion of as much information as possible regarding quantity, life cycle, general criteria, and preferred technologies. The sub-systems/ sub-sub systems/ sub-assembly/ part of any projects cannot be included, as TPCR is primarily required for easy identification of Technology envisaged for the industry and such items shall form a part of RFP/RFI at the time of contract.

Clarifications and Points of Contact (POC)

6. For any more elucidations or explanations, please contact the Ministry of Defence (Acquisition Wing) or Service Headquarters. To make doing business easier, Points of Contact (POC) have been offered by each service as follows:

(a) Army. Col ADB (Industry)
Army Design Bureau; Tele No – 011-23018861
Email – ddgtechres-mod@gov.in

(b) Navy. Commander/ Cdr (NP)-AP IV
Tele No – 01126771525, Fax-6604
Email - dnp.apdnp@navy.gov.in

(b) Air Force. Directorate of Aerospace Design (DAD)
Tele No. AF Exchange (VB) – 011- 23010231 Ext 7883

Links to Services 'Make'/iDEX Projects

7. To increase industry awareness and understanding of the objectives of the GoI 'Make in India' initiative, the following links to each 'Make'/iDEX are provided on the service hosted on the Ministry of Defense website:-

(a) Army. indianarmy.nic.in/content2/adb/development-routes

(b) Navy. https://www.makeinindiadefence.gov.in

(c) Air Force. www.makeindiadefence.gov.in/projects/projectlist.

(d) iDEX. https://idex.gov.in/challenges

Links to 'Srijan Portal' and 'Triveni Tech Bulletin'

8. 'Srijan Portal' and 'Triveni Tech Bulletin'. Owing to the geo-political uncertainities, there is a need to take a re-look at our dependencies on global imports & supply chains. Towards this, the GoI has launched a portal for indigenisation of items of defence sector termed as Srijan. Further, to enable the industry to be aligned with the Services' perspective on futuristic defence technologies, HQ IDS brings out a bi-annual tech bulletin named Triveni. The links to these are as under:-

(a) Srijan. https://srijandefence.gov.in

(b) Triveni. http://ids.nic.in->Publications->Triveni Tech Bulletin

Disclaimer

9. This document does not constitute a commitment by the Indian Armed Forces or any Indian government agency to purchase any particular type, manufacturer or quantity of equipment. The Government of India reserves the right to change, delete or add any part of this document without assigning any reason. Industry involvement in the Indian Armed Forces' document "Technology Perspective and Capability Roadmap" is solely at its own discretion.

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TPCR 2025: INDIAN ARMY

Single Point of Contact- 011-23018861 Col ADB (Industry)

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
ARMOURED FIGHTING VEHICLES SYSTEMS				
Tanks				
1.	**Active Protection System (APS) (Armoured Fighting Vehicles (AFV) protection and Counter Measures System for Tank T-90 S/SK)**	10	800 - 850	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. 360° Protection by defeating / degrading incoming projectiles by incorporating audio visual warning and soft & hard kill measures. Vertical coverage 90^0. Weight <1000 kg. **Remarks by DRDO – Under Development at DRDO**				
2.	**Armour Protection**	50-60	3000-3500	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Armour providing protection of Rolled Homogenous Armour Equivalent (RHAe) > 1000 mm.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
3.	**Future Ready Combat Vehicle (FRCV)**	40	1700-1800	Col ADB (Industry) 011-23018861

Broad Parameters / Preferred Technologies. Proposed to replace T-72 tank fleet as a multiple weapon platform incorporating niche technology and capability to operate in a highly network centric environment along Northern & Western Borders.

(a) Human-Machine Teaming & Integrated Intelligence Surveillance Reconnaissance (ISR) Capability. Fully digitised system capable of Human-Machine Teaming and control of on-board or off-board unmanned systems (UGVs, UAVs & LMs).

(b) Net Centric Warfare. Integrated Battlefield Management System (BMS) and Identification of Friend or Foe (IFF) Systems giving common operational picture to support collaborative all weather operations.

(c) BLOS Strike Capability. Able to employ LMs (Loiter Munitions) in conjunction with surveillance drones (compatible with in-service surveillance drones with suitable human interface) as a system from the platform.

(d) 360° Vision. Day/night sensors mounted on hull and turret, providing 360° stitched mosaic panoramic view of outside the platform, with suitable inputs to the C4I system.

(e) Cyber Warfare & Electronic Warfare (EW) Capability. Fully cyber hardened, capable of operating in a contested Intense Electronic Warfare (EW) Environment with Counter Jamming abilities for a secure voice & data communication, as well as for controlling Drones / Swarms.

(f) Navigation. Defence Series Maps (DSM) compatible Hybrid Navigation System retaining the capability for incorporating satellite [Indian Regional Navigation Satellite System (IRNSS)] and Inertial Navigation.

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
4.	**Light Tanks**	35-45	300-400	Col ADB (Industry) 011-23018861

Broad Parameters / Preferred Technologies. Light Tank with capability to act as a multiple weapon platform along with infusion of niche technology will address threats in varied terrains & domains. Superior mobility, agility, multi-layered protection, precision lethal firepower, real time situational awareness and integration of available niche technology will offer multiple options for rapid deployment. Certain niche capabilities are given below :-

(a) Integrated Intelligence Surveillance Reconnaissance (ISR) & Targeting Capability.

(i) *Able to employ Loiter Munitions in conjunction with surveillance drones as a system from the platform.*
(ii) *Tethered Drone Operating Capability.*
(iii) *Counter Drone Capability.*

(b) Net Centric Warfare. Integrated Battlefield Management System (BMS) and Identification of Friend or Foe (IFF) System providing common operating picture.

(c) Electronic Warfare (EW) Capability. Ability to operate in Intense EW Environment with Counter Jamming capability and secure voice & data communication.

(d) Navigation. Defence Series Maps (DSM) compatible Hybrid Navigation System, retaining the capability for incorporating satellite IRNSS and Inertial Navigation.

Remarks by DRDO – Under Development at DRDO

5.	**Improved Ordnance & Recoil System**	250 EFC	1500-1700	Col ADB (Industry) 011-23018861

Broad Parameters / Preferred Technologies. Presently T-90 tanks are unable to fire ammunition with a Depth of Penetration higher than 600 mm. To enhance lethality there is a requirement to fire ammunition with Depth of Penetration higher than 800 - 1000 mm for which the Ordnance and gun article needs to be upgraded.

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
6.	**1350 HP + 10% Engine of T-90 Tanks with Associated Automotive Peripherals**	**Engine Assembly - >1000 hrs** **Power Train - >5000 hrs**	450 - 500	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. T-90 tanks are deployed along Northern borders at HAA. Due to rarefied atmosphere the performance of the engine reduces which adversely impacts the battlefield mobility. Present T-90 tanks are being fitted various upgrades i.e with Mine Plough, Active Protection System, Auxiliary Power Unit & Integrated Surveillance and Targeting Sys which will increases the weight of T-90 tanks thereby reducing the power to weight ratio and hence will affect the battlefield mobility of T-90 tank. Requirement are Power to weight ratio – 25 HP/ton, JSS /MIL std complaint, 7 forward & one reverse, Fit in space of engine & transmission compartment of T-90 Tank, Obst crossing capability - not to be impacted .Weight < 1500 Kg.				
7.	**Situational Awareness System for Mechanised Forces**	15 years	3500-4000	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. High level of situational awareness to a Combat Team / Combat Group / Combat Command down to individual tank level including own position, friendly forces position, capability to pass diagrammatic orders, indicate enemy positions, share text messages, rearwards integration with surveillance network, etc.				
Infantry Combat Vehicles (ICV)				
8.	**Power Pack**	850-900 hrs	2000-2200	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Power rating 360 - 450 HP, Integrated with automatic transmission, Power to Weight Ratio > 25, Hybrid Capability				
9.	**Armour Protection**	10-15	2000-2200	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. All round STANAG level 4. **Remarks by DRDO – Developed**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
10.	**Driver Night Sight**	15 Yrs	3000-3200	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *System will be required to operate in temperature ranges of -20^{0}C to +45^{0}C. Sight based on third generation Uncooled thermal camera and monochrome low light camera. The sight should be of form fit design with min DRI ranges 400m/250m/150m, Minimum FPA 640 x 512, FOV Min 44^0 x 33^0 (+/- 3^0).* **Remarks by DRDO – Developed for MBT Arjun**				
11.	**Night Vision for Gunner & Commander for BMP-2**	10-15 Yrs	2000-2200	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *Gunner Sight - 3rd Gen with min DRI ranges up to 10 / 4.5 / 2.5 Km and Minimum FPA 640 x 512. Commander Sight - Panoramic with Commander capable of firing all on board weapon systems & Min FPA 640 x 512.* **Remarks by DRDO – Developed**				
REMOTELY PILOTED AIRCRAFT AND SYSTEMS				
12.	**Stealth RPAs**	20	55-70	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *MALE/HALE RPAs (range up to 1,500 Kms and alt 50,000 to 60,000 ft) with stealth capability to avoid detection by enemy radars. Capability to incorporate special payloads including communication interception equipment, jamming weapons and NBC detection, Direction of Own Artillery Fire.*				
13.	**Special Optical Payload**	20	20-30	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *Multiple Optical Camera in a single payload with capability of handling each camera independently and covering a large swath of approximately 100 km.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
14.	**Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces**	**Surveillance Drone** Not less than 1000 landings, 10 years for IT eqpt & minimum 500 battery charging / discharging cycles. **Loitering Munition** 10 years or more.	700-800	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. Requirement for providing integral Intelligence Surveillance & Reconnaissance (ISR) capability complemented by precision targeting capability. Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces can be effectively employed in both defensive and offensive operations. Broad parameters are as under:- *(a) Range of UAV - 20 km one-way and Loitering Munition - 15 km one way.* *(b) Endurance of 90 min (surveillance drone) and 15 min on tgt (LM).* *(c) Warhead. Shaped charge top attk with Tandem Warhead with Penetration 150 mm RHA beyond ERA.* *(d) Integrated OCU for op both drone & LM.* *(e) AI enabled tgt recog capb. Tgt engagement with 'Man in the Loop'. Reuse capability of Loiter munitions, Encryption & Anti Jamming, VTOL/Tube launched.* *(f) Direction of Own Artillery Fire.*				
15.	**Unmanned Aerial Vehicle Launched Precision Guided Missiles (ULPGMs)**	**Surveillance Drone** Not less than 1000 landings, 10 years for IT equipment and minimum 500 battery charging / discharging cycles. **Loitering Munition**. 10 years or more.	350-400	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters / Preferred Technologies. *Beyond Line of Sight surveillance and targeting capability. Broad parameters include an Operating range of Not less than 10 km one way. Launch Altitude Not less than 4500 m AMSL and Operating Altitude Upto 1000m AGL. Endurance of Minimum 35 min. Munition range of minimum 2.5 km in day and 1.5 km at night, with pre-fragmentation and anti-armour warheads. Lock on after launch capability.* **Remarks by DRDO – Developed by DRDO**				
WEAPONS AND SYSTEMS				
16.	**Manpack Counter Improvised Explosive Device (IED) Robotic System**	10	600-700	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. IED detection technology / sensors other than visual detection. *Carry out surveillance and explosive ordnance disposal inside vehicles, trains, aircraft, and larger open areas. Equipment should have video cameras and disruptor. Weightlifting capability of the equipment should be approximately 2 kg. Equipment should have capability of being radio controlled in urban/ built up areas at a distance not less than 100m. Equipment should enable hand held wired control up to 200m. Weight of the equipment should not exceed 15 kg.*				
17.	**Automated / Vehicle Mounted Infantry Mortar System**	15	2500-3000	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. *Vehicle Mounted 81 mm Mortar Sys capable of achieving a range up to 5-6 km and deployment time of maximum 2-3 mins. The integrated system should comprise of the vehicle as firing platform. It should integrate an 81 mm Mortar (In service). Target Acquisition system (from Observation Post end). Communication system with voice and data for relay of target data (preferably through SDR). It should have FCS / Ballistic computer, storage for ammunition and provide ballistic protection for crew.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Materials and Paints				
18.	**Integrated Mobile Camouflage System (IMCS)**	>5	06 aircraft	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *(a) Terrain specific Camouflage.* *(b) Reduces thermal signature of tank.* *(c) Significant reduction in detection from BFSR (SR).* *(d) Prevent detection from FLIR camera.*				
MISSILES AND SYSTEMS				
19.	**Air to Air Missile System for Helicopter**	30	500-550	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *(a) Air-to-Air Missile System for integration on identified helicopter platforms.* *(b) Missile should be fire-and-forget type, propelled by stable solid propellant.* *(c) Equipped with a robust advanced IR seeker to engage rapidly maneuvering aerial targets ie helicopters, fixed wing as well as unmanned aerial vehicles.* *(d) SSKP of 90% or more.* *(e) Maximum range of the missile should not be less than 7 km.* *(f) Firing of missile should not affect helicopter flying characteristics or damage to other components.* *(g) Fitment/ removal of launcher should be possible in short time in field conditions.* *(h) The shelf life of the missile should exceed 10 yrs.* *(j) Complete system should be capable of being stored/ maintained in field conditions and should be safe for transportation by road, rail or air.* *(k) Capability to engage multiple targets simultaneously by salvo firing and utilise multiple guidance technologies for increased immunity to counter measures.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
20.	**4th / 5th Generation ATGM**	24	20000-50000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Tech. Maximum Effective Range should not be less than 5 Km by day and night. Minimum range achievable be attempted, but not more than 200 meters. Accuracy with a hit probability of not less than 90% by day and night. Active/ passive guidance system (with-Lock-on-Before-Launch and Lock-on-After-Launch capability). HEAT, Tandem warhead. Should have fire and forget, fire & observe, direct and top attack capability. To be fired in mounted role from BMP-2/2K and Manpack Ground Role for Infantry. Achieve minimum penetration of 800 mm RHA beyond ERA. **Remarks by DRDO – Under Development**				
21.	**ATGM (Tank)**	10-15	20000-50000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. 3rd / 4th / 5th Generation ATGM, Range > 5 km, Depth of Penetration > 800 mm beyond ERA. **Remarks by DRDO – Developed for 650mm DOP**				
		AMMUNITION		
22.	**125mm APFSDS (Armour Piercing Fin Stabilised Discarding Sabot) Ammunition**	**10 Years**	Large Number	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Depth of Penetration (650 mm) minimum. **Remarks by DRDO – Under development for 530mm DOP**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
23.	**30 mm Proximity Amn**	15 Yrs	HE(I) - 3.00,000 HE(T) - 75,000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Muzzle velocity (m/s) < 1000 M/Sec. Self-destruction time of Fuze (s) ≥ 8 Sec. Range Ground target Aerial targets altitude slant range < 4000M. End Use Anti-personnel and against non-armoured and aerial targets. Shelf Life Not less than 15 yrs. Proximity timed fuze.				
24.	**Enhanced Range Artillery Projectile**	15	600,000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Concept of Enhanced Range Artillery Projectile hinges on increasing the range of existing 155 mm ammunition system to 60-70 Km. It compliments existing HE, HE ERFB/BT and HE ERFB/BB ammunition system. Enhanced Range Artillery Projectile should be compatible with all calibers of 155mm i.e 39/45/52 and should have range up to 60 Kms with and MV of 925 m/s. The project designs combine rocket Mortar and BB Units in single project. **Remarks by DRDO – Under Development**				
25.	**Flares & Chaffs for Helicopters**	15	Flares - 4,00,000 Chaffs - 2,00,000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Flares and Chaffs form integral component of Electronic Warfare Suite (EW Suite) fitted on helicopters to increase survivability in tactical battlefield area. These are dispensed once the EW Suite detects an Anti-Aircraft Missile threat to lure the missile away from the aircraft by painting a false target. *(a) Flares. Flares should be capable of producing higher intensity radiation than the radiation intensity of the aircraft in IR wavebands. Flares should have ejection velocity of 25-50m/sec with physical attributes of 1" x 1" x 8" for compatibility with legacy dispensing systems.* *(b) Chaffs. Chaffs with physical attributes of 1" x 1" x 8" for compatibility with legacy dispensing systems should be capable of producing cloud of aluminium / metallised by painting a false target larger than the Radar Cross Section (RCS) of helicopters in service.* **Remarks by DRDO – Developed**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
26.	**155 mm Trajectory Correctible Munition (TCM) / Course Correctible Fuze (CCF)**	15	2000-2200	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Concept of CCF hinges on exploiting the existing inventory of munitions. The fuze has GPS and micro controller which guide / correct the projectile towards the ranging point. CCF should be compatible with all calibres of 155mm i.e 39/45/52 and should have the capability to be guided by GPS/INS with CEP less than 50m.				
27.	**23 mm Pre-Fragmentation Ammunition with Proximity Fuze**	10	5000-5500	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. The smart ammunition needs to be developed for Zu 23 mm guns and should incorporate pre-fragmented and proximity fuze for 23 mm calibre.				
SUPPORT AND SMALL ARMS				
28.	**9x19 mm Machine Pistol**	10	23,000-25,000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. 9x19 mm Machine Pistol with enhanced range and accuracy. **Remarks by DRDO – Developed**				
SENSORS				
29.	**Passive Weapon Acquisition Sys**	20	70-100	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. State of the Art, Passive Weapon Acquisition Systems to augment the Target Acquisition by RPAs, satellites/Aerial Photos and Weapon Locating Radar. System could be a mix of diverse technologies like Sound Ranging System and Unattended Ground Sensor and Flash Spotter. Should provide continuous 24 hours coverage. Consists of sensor posts which could include sensors with wireless links and power supply units and command posts which may consist of ruggedized laptops and accessories for communication links, printing and interface with the Battle Field Surveillance System. Interface with Battlefield Surveillance Systems, in service C2 System (Shakti) & in service Weapon Locating Radar.				
30.	**TI Sights**	08-10	55,000-60,000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Minimum Focal Plane Array (FPA) of 640 x 512 with pitch of min 17 microns or less, uncooled, micro bolometer detectors.				
	TI Sight	*Detection (in metres)*	*Recognition (in metres)*	
	Sight for Assault Rifle	*500*	*350*	
	Sight for LMG	*1000*	*700*	
	Sight for MMG	*1500*	*700*	
	Sight for AGS-30	*700*	*500*	
31.	**Image Intensifier Sights**	08-10	1,80,000-2,00,000	Col ADB (Industry) 011-23018861
Broad Parameters/Preferred Technologies. Min Figure of Merit 1700, 3rd Generation.				
	II Sight	*Detection (in meters)*	*Recognition (in metres)*	
	Sight for Assault Rifle	*500*	*300*	
	Sight for LMG	*1000*	*700*	

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
32.	**Advance Optical Theodolite (AOT)**	20	100-120	Col ADB (Industry) 011-23018861
Broad Parameters/Preferred Technologies. AOTs are used to enable alignment on a common grid. Field of View> 1^0 20 minutes, Magnification > 20 time, Digital Compass < 3 mils, Laser Range Finder, Digital display, Rechargeable Battery & Mil Grade.				
33.	**Helmet Mounted NVBs**	08-10	Large Numbers	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. The equipment should be less than 1 kg, snug fit, water and weatherproof. It should be capable of being fitted on existing helmets. It should be capable of detecting and identification in pitch dark conditions.				
34.	**IR Seeker and Accelerometer**	20	5000-5500	Col ADB (Industry) 011-23018861
*Board Parameters/Preferred Technologies. Indigenous development of IR seeker and accelerometer with higher **G** Rating (+/- 10 - 30 **G**) and angular acceleration sensitivity of 0.001 rad/sec^2. In addn, IIR Seeker- Dual band to be also devp having conformal form factor to existing msls (90-100mm).* **Remarks by DRDO – Under development**				
COMBAT ENGINEERING				
MINE WARFARE				
35.	**Man Portable Mine Dispensing System (Including Mines)**	15 (in storage)	300-350 sets	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. This is a man-portable system required to dispense mines for rapid laying of minefield in all terrains. The system should be modular in construction and easy to carry and deploy. The system should be capable of dispensing cluster of mines (2 to 4 mines) in a single salvo and be capable of firing multiple such salvos in a short period of time. Both dispensing system and customised anti-personnel and anti-tank mines would require to be developed.				
36.	**Autonomous AI Based UGV for Mine Laying**	15 (in storage)	150-200 sets	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. This is an autonomous AI based system for laying of mines held in the inventory of IA.				
37.	**Explosive Based Minefield Breaching System**	15	50-70 sets	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. Equipment should be able to breach through a minefield using explosives, thereby creating a path for troops and equipment.				
38.	**Drone Based Mine Delivery System (including mines)**	Drone – 08 Yrs Mines – 15 Yrs	150-200 Sets	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. This is a smart (networked) Drone based system for dispensing mines for rapid laying of mine field in all terrains. The system should be modular in construction and easy to carry & deploy. The system should be capable of dispensing cluster of mines (2 to 4 mines) in a single salvo, and be capable of firing multiple such salvo in a short period of time. The system would consist of the following: - *(a) Mine Dispensing Drones.* *(b) Customised anti personal and anti-tank mines.*				
39.	**Minefield Breaching Equipment**	700-1000 Km of breaching	40-50 Sets	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Should be able to clear pressure actuated, double action, influence and tilt rod mines to provide approximately 4-5 m wide safe lane for vehicles. There should be not more than four pieces of equipment in one set. The equipment should clear at least 90% mines in one pass and minimum breaching speed should not be less than 3 KMPH in deserts. Installation/ handling of equipment should be possible using in-service cranes. To be mounted on in-service tank/ on a suitable platform. **Remarks by DRDO – Developed**				
40.	**Vehicle Based Mine Scattering System**	15	150-200	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. The equipment is required to dispense mines from a vehicle to rapidly lay mines. It should be based on in-service high mobility vehicle, with the system mounted on top, capable of dispensing at least 600 anti-tank mines using dispensers and similar capb for anti pers mine as part of the same overall system while travelling at a speed of 10 KMPH without replenishment. The system should be capb of functioning in auto/ manual mode and recording the data on digitized maps. **Remarks by DRDO – Under development**				
41.	**Equipment for Detection of Buried Objects**	10	20-30	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. Equipment will be utilised for detection of mines, improvised explosive devices (IEDs)/ caches from a standoff distance. Capable of scanning an area from a standoff distance of minimum 5000 feet and detecting mines buried underground. Minimum diameter of mines which the equipment should detect would be approximately 50 mm. The equipment should also be capable of detecting underground IEDs and caches. Equipment should be capable of being utilised in vehicle mounted or helicopter/ RPA configuration. Output of the equipment/ sensors should be real time.				
BRIDGING				
42.	**Heliportable Bridge**	25-30	20-30	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. To be utilised in mountains/ inaccessible areas. The bridge should be made of light weight/ composite material. Equipment should be capable of being transported by in-service helicopters, in palletised/ under slung mode. 10m fully constructed bridge should be capable of being transported in under slung mode. It should be modular in design to enable varied configurations. **Remarks by DRDO – Developed**				
43.	**Two Way Light Weight MLC-70 Bridge (Replacement for Bailey Bridge)**	30	50-70 sets	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Bridge made of modular parts, enabling construction in different configurations of load carrying capability and span. The equipment should be capable of sustaining Military Load Classification (MLC) 70. The equipment should be capable of being constructed for one / two way traffic as single/ double lane bridge. Bridge parts should allow manual handling by a maximum of six personnel per modular part.				
CBRN				
44.	**Decontamination System**	30	300-400	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. The System should enable decontamination of personnel, equipment, vehicles and infrastructure against all forms of nuclear and chemical contamination. The decontamination system should be mobile and able to operate in all environments.				
COUNTER IED / UXO / OXB				
45.	**Autonomous AI based Unmanned Sys For Detection of Unexploded Bombs / Ordnance / IEDs**	07	100-150 sets	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. An unmanned (ground / aerial) AI based system which should be able to search and detect UXO / UXB / IED, in confined spaces. System should be capable of being deployed in standalone or cluster mode.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
46.	**Laser Based Ordnance Disposal System**	15	10-12 sets	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. *This system should be capable of destroying UXO/ UXB/ IEDs from stand-off distance using Laser. The System preferably should be mounted on a light vehicle for easy transportation and use.* **Remarks by DRDO – Developed**				
47.	**CIED Equipment for Detection & Disposal of IEDs / UXOs / UXBs**	07	50-70 sets	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. *To be utilised for detection and disposal of CIEDs/ UXO/ UXB. Each set would consist of various man-portable equipment for detection and disposal task.*				
FIELD DEFENCES				
48.	**Hardened Flexible Composite Material for Protection against Small Arms**	15	Large Numbers	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. *This flexible composite material would be used for hardening of structures & equipment.*				
49.	**Modular 3D Printed Field Defences**	15	Large Numbers	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. *This system would be used for rapid construction of field defences in forward areas. The parts produced should, both individually and joined together, be capable of withstanding fire from high calibre ammunition.*				
RECCE SYSTEM				
50.	**Drone Based LIDAR assisted Track Alignment System**	08	100-120 sets	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. This system would be used for carrying out aerial recce of various terrain to achieve the most efficient track alignment for construction. The system would consist of the following:- *(a) Drone (Fixed / Rotary Wing) with sensors like LIDAR, IR,EO / EI, etc to carry out terrain mapping and profiling both during day and night.* *(b) Ground Control Station with suitable GIS to create, manage, analyse and map the data received from sensors mounted on the drone.* *(c) This system should be capable of operating in High Altitude / Mountain / Plains.*				
EW AND COMMUNICATIONS				
51.	**Integrated EW System**	12	02 - 03 systems	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. It involves development of multifunction EW system with Active Phase Array. The integrated system should have small size, weight and power requirements. It should be modular and be possible to mount on HMVs or tracked vehicles (BMPs) for employment in plains and deserts.It should be an analysis based EW system with state of the art Decision Support System employing heuristics analysis that utilize policy based technology like Policy Administration Point (PAP). The system must be able to detect, classify, locate and monitor communication targets (FF, Burst & FH) in deserts and plains. Should be able to: - *(a) Deny effective use of spectrum (Fixed Frequency (FF), Burst and Frequency Hopping (FH)) in plain terrain.* *(b) Detect, monitor, locate and jam enemy cellular receivers and satellite communication receivers.* *(c) Detect low Probability of Intercept Radars with precision and jam these radars.* *(d) Carry out multiprotocol target detection, classification, identification, locating and jamming.* *(e) Should have demodulation, decryption and voice recognition software tools built in the system.* **Remarks by DRDO – Developed for mountains under development for Plains/ desert**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
52.	**S Band Satellite Terminals**	10-15	7,000-8,000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Handheld, Manpack and SATCOM Messaging terminal using S Band. IRNSS capability to be incorporated. **Remarks by DRDO – Developed**				
53.	**Software Defined Radio (SDR)**	15 Years	More than 60,000 of all types	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. SDRs are envisaged to be used in Handheld, Manpack, Truck/ Ground and AFV roles for ground to ground and ground to air communications, supporting voice, data and video communications with TRANSEC and COMSEC capabilities. **Remarks by DRDO – Developed**				
54.	**High-Capacity Radio Relay (HCRR)**	15-20	2000-2200	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. The Radio Relay equipment should provide a data rate of at least 1-2 Gbps with communication ranges of between 20-30 Kms. It should be possible to operate in both point to point and point to multi point modes with base band interface (E1, E3, IP, Optical etc). The system should be ruggedized to cater for JSS-55555 standards. The engineering design should employ latest design parameters.				
55.	**Compact Tropo-scatter**	15	20-25 pairs	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Compact Tropo-scatter Communication System is envisaged to be a light-weight deployable communication system with capability to establish trans-horizon (beyond time of sight) communication links over a long distance (60-100 Kms) with throughput (200 Mbps) and built in secrecy. The system should also facilitate software-based RF/ Link analysis & planning. **Remarks by DRDO – Developed**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
		SIMULATORS		
56.	**New Gen Missile Simulator for Anti Tank Guided Missile and Air to Air Missile for Helicopters**	10 Yrs	100-120	Col ADB (Industry) 011-23018861

Broad Parameters/ Preferred Technologies.

(a) Primarily a computer based static indoor training aid, must provide the actual equipment layout and controls available to the Weapon System Operator (WSO)/ Pilot Gnr.

(b) A full scale external view as available to the WSO and pilot in the helicopter must be projected by means of a projection system.

(c) Realistic indications on mock flight deck in accordance with laid down procedures and business logic of the target acquisition and engagement system.

(d) Should enable WSO to practice target detection, recognition, acquisition & engagement during day/night incl NVG mode.

(e) Targets depicted to provide realism in distance, size, shape, relative speed during engagement & be overlaid on terrain data.

(f) The missions should be configurable in terms of weapon load, helicopter routing, flight parameters, targets, route to be followed by targets, terrain being overflown, visibility weather conditions.

(g) De-brief of the missions should be enabled through replay of actions taken by the trainee and their evaluation vis-à-vis laid down procedures. Simulated procedure for engagement of targets by other weapon systems fitted on the helicopter be also included. Operation of Self Protection Suite in a hostile environment may also be encompassed.

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
		SPECIALISED VEHICLES		
57.	**Armoured Recovery Vehicle**	30 Yrs	100-120	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *The armoured recovery vehicle will be a tracked vehicle based on the platform of an AFV. The vehicle will have matching mobility with Tank T-72 and T-90 series with minimum power to weight ratio of 22 - 25 HP / Ton. The laden weight should not exceed 50 Ton. The vehicle will be employed as ARV and AVT (FR) to perform in-situ recovery and light & field repair of tanks in service in Indian Army. The vehicle should have provision of crane with minimum capacity of 15 Ton with main winch and minimum capacity of 30 Ton in direct pull and an anchorage arrangement of 90 -100 Ton using auxiliary winch and towing. It will assist in carrying out essential tasks as part of repair and recovery support to the in-service tank based units during operations.* **Remarks by DRDO – ARRV for MBT Arjun developed**.				
58.	**Light Recovery Vehicle (LRV)**	10 Yrs	200-250	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. *The light recovery vehicle should be capable of operation by all the three services engaged in all terrain conditions in the country. The vehicle should be capable of un-ditching, up-righting and extricating up a slope of in-service vehicle casualties up to Lorry 10 Ton payload class. Rigid and suspended tow of wheeled vehicle casualties in all terrain and climatic conditions with under lift capability of supported loads up to 10 tons. The underlift should be hydraulically operated and with extension of minimum 4 metres. The crane should be single boom hydraulically operated with capacity of minimum 10 tons and capability to 360 Degree swivel with minimum reach of 3.4 metres on the sides. Capable to do self-recovery. It should have provisions for hydraulically operated support legs under the chassis to anchor the recoveries during recovery operations.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
59.	**Armoured Amphibious Dozer**	20	100-120	Col ADB (Industry) 011-23018861

Broad Parameters / Preferred Technologies. The equipment should be capable of crossing water obstacles with minimal preparation. The equipment should be able to move cross country at a speed not less than 20 KMPH, and thereafter undertake earthmoving tasks. The equipment should be capable of operating a jib crane of upto 3 Ton capacity. It should have protection against Nuclear, Biological and Chemical weapons. The equipment should be capable of exiting water obstacles with steep slopes. Approximate earthmoving capability of the equipment should be as under:-

Haulage (M)	Output (Cum/Hr)	
	Day	Ni
25	250	230
50	180	150

60.	**Tracked Light Dozer (TLD)**	20	150	Col ADB (Industry) 011-23018861

Broad Parameters/ Preferred Technologies. Heliportable dozer capable of being broken down into modular parts for rapid assembly & disassembly in field. The equipment should be capable of being broken down into smaller easily transportable loads. The TLD should be able to perform upto 4000 m above MSL. Each separate load must be within 1.5 Ton weight and dimensions Length (4.0m) x Width (2.27m) x height (2m).

CAMOUFLAGE & CONCEALMENT

STEALTH TECHNOLOGY

61.	**Adaptive Stealth Technology for Vehicles & Equipment**	10 years	3000-3200	Col ADB (Industry) 011-23018861

Broad Parameters / Preferred Technologies. The system is envisaged to be capable of shielding military equipment, both while being stationary and while on the move, from ever evolving detection technology by mimicking surrounding temperature and terrain, thereby enhancing survivability.

Remarks by DRDO – Under development

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
62.	**Stealth Technology for Bridges against Multispectral Detection & Targeting Systems**	15 Years	100-120 Sets	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. The system is envisaged to be capable of providing protection to bridges (both temporary & permanent) against detection by various type of sensors including Thermal, IR, SAR, etc mounted on various surveillance and targeting devices. The system should be able to provide both passive means of detection avoidance, however, active measures may also be considered.				
MISCELLANEOUS				
63.	**Next Gen Optical Fibre Cable**	20	10,000 KM	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. It should be ruggedised OFC which would support DWDM based optical domain switching in a TBA with large No of fiber (12/24 Core) having universal ruggedized end connectors for quick layout. It should be easy to maintain in the field.				
64.	**Universal Board Master for PCB Debug**	15 - 20 Yrs	15 - 20	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Capable of finding faults to component levels in various types of multilayer printed circuit board. Equipment should have various independent sections to work separately as well as a part of whole equipment controlled by single software. Equipment should have 128 channels with voltage, current and frequency response signature analysis section along with minimum independent 64 channel digital functional testing section to run library driven functional test with circuit compensation technique suitable for all logic families. Equipment should have all measuring instruments section. It should have integrated software compatible for latest updates.				
65.	**Universal IT Testing Simulator cum Getter Activation with Universal Collimator**	20 Yrs	20-30	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Equipment should be compatible with all in service thermal imaging equipment and its software should be upgradable / add on any new software of ATP in future. Getter activation setup should have facility to provide required current and voltage adjustable through control panel for all in service and newly added thermal imagers. Collimator should have the facility for easy calibration of all thermal imaging sights. It should have different detachable setup for each thermal imager which should facilitate easy calibration of different thermal images through one collimator / setup. These detachable setups should have all required accessories like reference mirrors, adapters and accessories, etc. This is to implement the paradigm of minimum hardware, maximum software.				
66.	**Indigenous OBMs**	10	300-350	Col ADB (Industry) 011-23018861
Broad Parameters / Preferred Technologies. OBM should have power between 35 - 50 HP, with a 2-Stroke engine and rope pulley starting mechanism.				
67.	**High Power Dual Band (S, X & Ku Band) GaN Trans Receiver Modules**	20	50-60	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. The future radar should have capability to perform combined functions of svl, tracking and fire control of guns. Development of Dual/ Triple Band GaN based Trans Receiver Modules with increase power density and higher power output. These modules increase radar ranges & low Radar Cross Section pickup. The radar should have wideband operation capability with ECCM and enhanced efficiency, reliability & thermal conductivity. **Remarks by DRDO – Trans receiver for Radar and Seeker developed.**				
68.	**Miniature Power Solutions**	20	To be used for various radars being developed and proc for Army AD	Col ADB (Industry) 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Devp of light weight, miniaturised power supply solutions for confined spaces with large power output and long endurance for operations of the equipment/ system.				
69.	**AIML Based Deep Fake Detection Software to Enable Accurate Recognition of Deep Fakes**	03	05	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technology. Deep Fake Detection with 100% accuracy is currently not being achieved by any software available in the cyber domain. Even when a software is developed, it needs to be ensured that it is future ready since with regular advancement in technology, newer ways to create deep fakes are being developed and can be defeated by incorporation of AIML in this project.				
70.	**Automated Exploit Generation and Testing Framework**	03	01	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technology. (a) Framework to utilise distributed computing platforms (for example; Apache Spark, Hadoop) for parallel processing to handle large scale exploit testing of own network efficiently. (b) It should employ modular architecture (Python, Ruby) to support multiple exploit development technology and adapt to diverse vulnerability types available/ possible in own network. (c) It should implement scripting framework (Metasploit, CANVAS) for end to end automation, minimising manual intervention and human error that one existing in own networks. (d) It should utilise APIs and standard data formats (for example; CVSS) for seamless interoperability with existing security tools (vulnerability scanners, penetration testing platforms) and work flows.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
71.	**Advanced Evasion Technique Research Model**	03	02	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. *(a) Model to be capable of handling diverse evasion techniques that adversaries could employ and analysing their effectiveness across wide range of security defences.* *(b) It should utilise advance testing methods like realtime network simulation and traffic analysis of own networks to assess the efficacy of evasion techniques like Machine Learning (ML) and Generative Adversial Network (GAN) etc.* *(c) It should integrate the research model with existing threat intelligence feeds, security testing platforms and collaborative frameworks like MITRE ATT&K to validate finding in the real world environment, facilitate knowledge sharing.*				
72.	**AI as Service along with Infrastructure Setup**	05	4000 User	Col ADB (Industry) 011-23018861
Broad Parameters/Preferred Technologies. The system is expected to integrate the existing technology in the developed / under development software projects in the Indian Army. As the AI technology is rapidly evolving, the capability of system to adopt and implement the same without the need to re-engineer the entire system is a necessity of the future.				
73.	**Smart Adaptive Jamming against Swarm Drones**	15	40-50	Col ADB (Industry) 011-23018861
Broad Parameters/Preferred Technologies. To Jx multiple freq bands where Swarm drone operates.				
74.	**Electronic Denial Bubble**	15	40-50	Col ADB (Industry) 011-23018861
Broad Parameters/Preferred Technologies. Creation of electronically isolated bubbles of upto 15km radius.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
75.	**Time Spoofer**	15	40-50	Col ADB (Industry) 011-23018861
Broad Parameters/Preferred Technologies. Time spoofing for PNT sigs from GNSS.				
76.	**First Person View (FPV)**	15	1500-2000	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. 360-degree view, augmented reality (AR), night vision and thermal imaging, heads-up display (HUD), voice control, real time data fusion, secure communication, military standards compliance, modularity, AI driven analytics.				
77.	**Inflatable Dummy Weapons**	15-20	300-500	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Inflatable fabric, supported by a network of pressurized rubber tubes that form a kind of 'pneumatic skeleton' of the actual weapon, realistic look, deceive thermal imaging and heat-seeking missiles, various parts to generate heat signatures.				
78.	**CBRN Mini-Unmanned Ground Vehicle**	10-15	100	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Unmanned platform for CBRN recce, detection and remote monitoring in field conditions and in confined areas (bunkers/ buildings) with day and night vision capability. Planned capabilities of the system should include live video feed relay, robotic arm for sample collection and alarm system against CBRN agents.				
79.	**Self-Erecting Protection Inflatable Shelter**	15	400	Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. Modular palletised automated CBRN inflatable shelter which can be launched by drivers individually by push of a button form their CBRN safe driver's cabin.				
80.	**Replacement for Truck 5/7.5 Ton 4x4 GS**			Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies. ***Details can be obtained from Army HQ***.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
81.	**Replacement for Truck 2.5 Ton 4x4 GS**			Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies.		***Details can be obtained from Army HQ***.		
82.	**Bus ACX, Type-III**			Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies.		***Details can be obtained from Army HQ***.		
83.	**Modernisation of RODs**			Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies.		***Details can be obtained from Army HQ***.		
84.	**Modernisation of CASD**			Col ADB (Industry) 011-23018861
Broad Parameters/ Preferred Technologies.		***Details can be obtained from Army HQ***.		

TPCR 2025 : INDIAN NAVY

Single Point of Contact - For Indian Navy the SPOC have been mentioned against the respective entry.

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
SHIPS/ CRAFT				
Ships				
1.	**Aircraft Carrier**	40	01	POC- Cmde (ACP) 011-23793171
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised.				
2.	**Automatic Carrier Landing System (ACLS)**	15	05	POC- Cmde (ACP) 011-23793171
Broad Parameters/ Preferred Technologies. An aircraft recovery system for safe recovery of multi-role deck based fighter in Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC) as specified in ICAO Document.				
3.	**Fresnel Lens Based Optical Landing System**	15	05	POC- Cmde (ACP) 011-23793171
Broad Parameters/ Preferred Technologies. The OLS is a system of light arranged vertically and horizontally which provides the pilot with the desired glide slope to be maintained. The OLS light arrangement indicates the safe zone for approach and also the unsafe zone when the aircraft is either above or below the correct glide slope. The range of an OLS is typically 5000 meters.				
4.	**Combat Management Software (CMS) including Aircraft Control and Air Direction (ACAD)**	-	1	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised. **Remarks by DRDO – Under development**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
5.	**Electromagnetic Aircraft Launch System (EMALS)**	40	02	POC- Cmde (ACP) 011-23793171
Broad Parameters/ Preferred Technologies. EMALS is an aircraft launch system for catapult type of launch operations. Required for future aircraft carrier with CATOBAR concept of flying operations. **Remarks by DRDO – Under development**				
6.	**Next Generation Destroyers (NGD) / Next Generation Frigates (NGF)**	20-25	05-10	POC- Cmde (WDB) 011-20678710
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised.				
7.	**Next Generation Corvettes (NGC)**	20-25	07	POC- Cmde (WDB) 011-20678710
Broad Parameters/ Preferred Technologies. NGC would be capable of Surface and Underwater operations, Local Naval Defence and VBSS operations. Vessel would be fitted with Anti-Ship, Anti-Submarine and Close-in Weapons and Sensors.				
8.	**Mine Counter Measures Vessel (MCMV)**	30	>10	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. These vessels would be deployed to undertake Mine Counter Measure Operations. Approximate length of MCMVs will be about 87 m. The hull of MCMVs will be of steel construction, which will serve as mother ship for the MCM suite for undertaking MCM Operations. The MCMVs are envisaged to have a combination of Autonomous Surface Vessels/ Unmanned Surface Vessels/ Remotely Operating Vessels based Mine Identification and Disposal Systems. Other salient equipment/ weapon fit/ design features available onboard MCMVs would include Gun Mounts, Radars, Sonar, Electronic Warfare suite, Dynamic Positioning System and other standard systems/ features with respect to propulsion, stability/ seakeeping, communication, data link, IPMS, IBS, stealth, habitability, seamanship, diving etc for Naval ships.				
9.	**Unmanned Mine Counter Measure (MCM) Suite**	20	12	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. Unmanned MCM Suite would comprise of combination of CASCADE ASVs, AUVs and ROVs for mine identification, classification and neutralisation. The unmanned MCM suite would be deployed from MCMVs to operate in minefield providing standoff MCM capabilities.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
10.	**Fleet Support Ship (FSS)**	30	>5	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. Fleet Support Ship is envisaged to be approximately 220m long with approximately 44000T full load displacement to replenish Fleet Ships at sea with a minimum of five Transfer Points and to achieve pumping rates up to 2400 TPH. The vessels will be able to carry 25000T liquid cargo and 70 tons of victualing stores for the fleet. The ship will be propelled by two Marine Diesel Engines connected to single CPP shaft line. The ship would be fitted with Anti-Ship, Anti-Submarine and Close-in Weapons and Sensors.				
11.	**Replenish At Sea / Fuelling At Sea (Supply Ship) (RAS/FAS)**	25	20-25	POC- Cmde (NA) 011-21410483
Broad Parameters/ Preferred Technologies. Replenishment at Sea (RAS)/ Fuelling at Sea (FAS) system for supply ship iaw DEFSTAN 07 of 279 Issue 3.				
12.	**Landing Platform Docks (LPD)**	30	4	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. Landing Platform Docks are envisaged to embark, transport and land elements of a force for expeditionary operations using specialised surface craft and integral helicopters. It will act as mother ship for unmanned capability and to support operation of futuristic unmanned vehicles, platforms and equipment. The length of the LPD would be about 220m +/-5% and displacement of 29000T +/- 10%. The ships will be equipped with Multi -Function Radars, Air Surveillance Radars associated weapons/ equipment, Combat Management System, Integrated Full Electric Propulsion, Landing Craft Mechanised (LCMs) and Landing Craft Vehicle Personnel (LCVPs), Unmanned Vehicles viz, Remotely Operated Vessels, Unmanned Aerial Vehicles, Gliders.				
13.	**Next Generation Fast Interceptor Crafts (NGFIC)**	10	100	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. The FICs would be capable to carry out interception of high speed craft and seaward anti-terrorist patrols for coastal installations and naval harbours. The length of the vessel is expected to be 13 to 17 m and displacement of 17 Tons +/-10%. The craft will have a payload of 12.7 mm SRCG, Acoustic Warning Device and Hand Grenades. The craft will be equipped with 'I' Band Radar, NAV Radar MFCs, Class approved Compass and two suitably rated inboard Diesel Engines coupled to reversible gearboxes driving Articulated Surface Drive or Waterjets. Remote control facility should be provided for starting/stopping/operations of main engines and other machinery.				
14.	**Remotely Manned Fast Interceptor Crafts (RMFIC)**	10	20	POC- Cmde (SP) 011-26886427

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. The minimal / remotely manned FIC should be capable of being controlled by single operator from a single workstation either onboard or a remote station duplicated ashore, via RF and satellite link. The vessels would operate in shallow water in extreme tropical conditions. The length of the vessel is expected to be 13 to 17m and displacement of 17 Tons +/-10%. The craft will have a payload of 12.7 mm SRCG, Acoustic Warning Device and Hand Grenades. The craft will be equipped with 'I' Band Radar, NAV Radar MFCs, Class approved Compass and two suitably rated inboard Diesel Engines coupled to reversible gearboxes driving Articulated Surface Drive or Waterjets.				
Barges				
15.	**300T Sullage Barges**	20	4	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. Sullage Barges should be capable of receiving 300 Ton Sullage from ships and submarines alongside and at anchorage for discharge at designated points. The Sullage may consist of contaminated POLs or bilge residues. The length of the barge is envisaged to be approximately 40m. Barges should be able to carry out its functional role up to Sea State 3.				
16.	**200 Ton Non-Propelled Water Barge**	20	3	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. The Non-Propelled Water Barges shall be capable of replenishing fresh water to ships and submarines in harbour alongside and at anchorage. The length of the barge is envisaged to be approximately 30m with displacement of the Barge not more than 800T. The Barges should be capable of operating upto sea state 3.				
17.	**Technical Support Craft**	30	1	POC-Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. Technical Support Craft (TSC) shall be capable of ferrying personnel and stores between Yard and ships at anchorage or outer harbor and undertake repairs and overhaul of workshops, machinery and equipment. The envisaged length of the barge shall be approximately 50m with displacement not less than 420T. The vessel should be propelled by Diesel Electric propulsion. The Barge should be capable of operating upto sea state 4.				
18.	**200T Self Propelled Water Barge**	20	03	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. The Barges shall be capable of replenishing fresh water to Ships and Submarines in harbour (alongside) and at anchorage. The length of the barge is envisaged to be approximately 30m with an endurance of upto 100 Nm. The Barges should be capable of operating upto sea state 3.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
19.	**200T Self Propelled Sewage Barge**	20	06	POC- Cmde (SP) 011-26886427
Broad Parameters/ Preferred Technologies. The Barges shall be capable of receiving sewage from ships, treating the sewage consisting of black and grey water and its discharge. The length of the barge is envisaged to be approximately 60m. The Barges should be able to operate independently for 24h without replenishment of POL. The maximum envisaged speed of the barge is 10 Km. The Barges should be capable of operating upto sea state 3.				
SUBMARINES SYSTEMS				
20.	**Off Board Vehicles**	15	12	POC- Cmde (SMAQ) 011-23010096
Broad Parameters/ Preferred Technologies. Sub-systems to be developed are Ejection System, UW Communication, Electronic Control, Payload for vehicle.				
21.	**High Endurance Autonomous Underwater Vehicle (HEAUV) for Anti-Submarine Warfare (ASW) and Multi Mission (MM) roles**	15	20	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. HEAUVs are planned to be inducted. The HEAUVs should be able to undertake mission such as ASW, MCM, ISR, ELINT and bathy measurements through its integral payloads. **Remarks by DRDO – Under development**				
22.	**Diesel Alternator Rectifiers Indigenous Conventional Submarine**	25	12-15	POC- Cmde (SMAQ) 011-23010096
Broad Parameters/ Preferred Technologies. The Diesel Alternator Rectifier that can provides DC power of 1.25MW-1.5 MW under a minimum back pressure of 2 Bar (during operation at Periscope Depth). The engines should be able to operate in marinised environment. Values will be finalized by 2025 post completion of sketch design.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
23.	**Submarine Electrical Propulsion Motor for Indigenous Conventional Submarine**	25	6-8	POC- Cmde (SMAQ) 011-23010096
Broad Parameters/ Preferred Technologies. The Electrical Propulsion motor with power of 4.5MW -5 MW for propulsion of the platform is to be permanent magnet synchronous motor. The motor is to be reversible and to be variable in RMP. The propulsion motor is to be capable of operation at voltage range of 304 to 560 V and load range of 50 kW to 4000 Kw approx. The Input supplies to the motor will be DC therefore Convertor and associated system are also needs to be develop. The propulsion switchboard also needs to be develop for operating motor is parallel and series connection of battery groups. The cooling of motor and associated system is also needs to be provided. Values will be finalized by 2025 post completion of sketch design.				
24.	**Integrated Combat Suites (ICS) for Conventional Submarine**	25	06	POC- Cmde (SMAQ) 011-23010096
Broad Parameters/ Preferred Technologies. Integrated combat suite which will include sonars, radars, communication systems like SATCOM, Periscopes, Masts for ICS payloads, MFCs, Torpedo Fire interface systems (TFIC), Torpedo Fire control system and other associated systems required for submarines. **Remarks by DRDO – Under development**				
25.	**Platform Management System for Indigenous Conventional Submarine**	25	~~10~~ 06	POC- Cmde (SMAQ) 011-23010096
Broad Parameters/ Preferred Technologies. The Platform Management System (PMS) will provide control of propulsion energy and diving safety. PMS includes Integrated Platform Management System (IPMS) & Remote Control & Monitoring System (RCMS). The IPMS should typically comprise of Propulsion Energy Console (PEC), Diving Safety Console (DSC), Screen for Second Officer (SSO), Multifunction Control Monitoring Station (MCMS), Printer Several PLC cluster & Communication Network. The RCMS comprises of Steering Console (SC), Propulsion Energy Panel (PEP), Diving Safety Panel (DSP) & Communication network.				
26.	**Power Aggregates for Submarines**	25	10	OC- Cmde (SMAQ) 011-23010096
Broad Parameters/ Preferred Technologies. To include switchboards, switchgear, conversion machinery, power shapers, transformers, invertors~~,~~ etc. The power technology should be based on IGBT, digital control with state of art feedback and monitoring to ensure smooth outputs in addition to high quality and reliability.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
27.	**Towed Wire Antenna System**	15	More than 10	POC- Cmde (SMAQ) 011-23010096
Board Parameters/ Preferred Technology. Towed Wire Antenna system should be designed to be deployed and retrieved from the submarine whilst in dived condition in order to receive VLF, LF, and HF signals while in submerged condition without compromising on safety, water tight integrity and stealth of the submarine.				
28.	**Lithium Ion Batteries for Indigenous Conventional Submarine**	10	06 sets of 02 groups min.	POC- Cmde (SMAQ) 011-23010096
Broad Parameters/ Preferred Technologies. Li Ion Battery chemistry is to be optimized for submarine use. The battery must have operation life of 10 years or min 4000 operational cycle. The losses in battery (namely active/ concentrated polarization, internal resistance and impedance etc.) may be reduced to the minimal point. The Li-ion battery design should provide linear performance & graceful degradation over the full life. The Battery Monitoring system (BMS) is also to be develop as a part of battery development. Battery should be protected against flooding, Mechanical shock (As per shock standard) and Thermal shock Sea water soaking. Charging cycle of battery should be more than 14 days. Values will be finalized by 2025 post completion of sketch design. **Remarks by DRDO – Under development**				
29.	**Thruster**	10	10	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. The electric thruster (motor and propeller) with power of 10 kw for propulsion of the platform is to be Permanent magnet Brushless DC. The motor is to be reversible and to be variable in RMP. The propulsion motor is to be capable of operation at voltage of 340 V and load range of 192 W to 11 KW approx. The input supplies of the motor will be DC.				
30.	**Static Frequency Converter for Indigenous Conventional Submarine**	25	12	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. The SFCs should be of Load or order of 80KVA and are to be capable of varying load. The converters are not to be of moving parts and should be high efficiency. The generated current are to be free from losses and voltage needs to be static. Values will be finalized by 2025 post completion of sketch design.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
31.	**Lithium Ion Batteries**	10	10 sets of 200 kWh each	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. Li Ion Battery chemistry is to be optimized for submarine use. The battery must have operation life of 10 years or min 4000 operational cycle. The losses in battery (namely active/ concentrated polarization, internal resistance and impedance etc.) may be reduced to the minimal point. The Li-ion battery design should provide linear performance & graceful degradation over the full life. The Battery Monitoring system (BMS) is also to be develop as a part of battery development. Battery should be protected against flooding, Mechanical shock (As per shock standard) and Thermal shock Sea water soaking. Output voltage should be of range 380-400 V. Output current should be of range 150 Amps to 507.5 Amps. Cell density should be within range of 230 Wh/kg to 250 Wh/kg. The enclosed system should be of temperature 20°C to 40 °C. The system should include a battery charger whose input can be 415 V, 250 Amps, AC three phase. Charging cycle of battery should be more than 3 days.				
32.	**Autonomous Diesel Generator for charging of Lithium Ion Batteries**	10	10	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. Diesel generator capable of operating autonomously based on State of Charge of lithium ion batteries. The broad capacity of the DG should be 99ekW, 50 Hz, 1500 rpm, 3 phase 415 V. The system should include pressure rated valves for intake and exhaust air.				
33.	**Navigation sensor suite**	10	10	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. Integrated communication suite consisting of Doppler Velocity Log aided Inertial Navigation System, Global positioning System, Underwater altimeter, Ultra Short Baseline (USBL) and Collision avoidance Front Looking Sonar, Pinger, Flasher. **Remarks by DRDO – Under development**				
34.	**Communication sensor suite**	10	10	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. Integrated communication suite consisting of Optical communication, Line of Sight Communication, SATCOM.				
35.	**Payload sensors suite**	10	10	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. Payloads for UUVs like ESM system, Electro optical / IR capable periscope/ camera, Radar, Bow conformal array sonar, Flank Array Sonar, Multi Beam Echo Sounder, Sub Bottom Profiler, CTD.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
36.	**AIP system for submarine**	25	6	POC- Cmde (SMAQ) 011-23010096
Broad Parameters / Preferred Technologies. Air Independent Propulsion System along with Fuel Cells, for Submarine application with a power output of more than 250 kW. The AIP Plant should contain all the sub-systems required for operation, control, safety and monitoring of the AIP Plant. Specifications and endurance of the system will be decided at the time of finalising submarine design. **Remarks by DRDO – Under development**				
WEAPONS AND SYSTEMS				
Marine Systems				
37.	**Torpedo (Range ≥25 Km and Speed ≥50 Knots)**	25	150	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The torpedo should be of 324mm, capable of being exploited from existing LWT Launchers in IN. The range of the torpedo should be in excess of 25Km and speed in excess of 50Kn. It should be able to operate upto depths of 450m. The torpedo should have advance Logic to counter modern submarine fired decoy. The torpedo HH should be able to detect conventional submarines at ranges in excess of 2500m. The torpedo should be universal for employment by air and surface units. **Remarks by DRDO – Under development**				
38.	**Extended Range ASW Rocket**	25	More than 2000	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The ER ASR is envisaged to have ranges in excess of 8500 m while retaining the dimensions of the extant AS Rocket (RGB60). The rocket should be capable of exploiting the present pistol YDB60 for detonation. Electronic fuze also suitable for YDB60. **Remarks by DRDO – Under development**				
39.	**Close in Weapon System**	25	30	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The system should be a missile cum gun complex with its integral fire control system. The range of missile and gun should not be less than 6 km and 4 km respectively. The gun should be of 20-30mm caliber with a rate of fire of not less than 4000. The missile and gun ammunition should be capable against fighters, missiles and surface crafts. It should have radar cum optical guidance facility.				
40.	**Foldable Helo Hangar Doors**	25	40-45	POC- Cmde (NA) 011-21410483
Broad Parameters/ Preferred Technologies. Specifications will be decided at the time of finalising ship design.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
41.	**Electro – hydraulic Davit**	15	80-85	POC- Cmde (NA) 011-21410483
Broad Parameters/ Preferred Technologies. 3-5 T capacity for hoisting 7-10 m Rigid Hull Inflatable Boats (RHIBs).				
42.	**Sewage Treatment Plants (STP) with VTS (Vacuum Toilet System)**	15	130-140	POC- Cmde (NA) 011-21410483
Broad Parameters/ Preferred Technologies. Capacities and numbers will depend on the class of ship and will be decided at the time of finalising ship design.				
43.	**Capstans (Anchoring & Mooring)**	25	80-85	POC- Cmde (NA) 011-21410483
Broad Parameters/ Preferred Technologies. Numbers, sizes and specifications will be decided at the time of finalising ship design.				
44.	**Automatic Power Management System (APMS)**	12.5	60	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. System compliant to IHQ/DEE specifications EED-50-48, which may be obtained from IHQ MoD (N) on as required basis.				
45.	**Switchboards**	12.5	>110	POC- Cmde (EE) 011-23011668
Broad Parameters/ Technologies. System compliant to IHQ/DEE specifications EED-Q-264, which may be obtained from IHQ MoD (N) on as required basis.				
46.	**Heavy Motors (>15KW)**	12.5	> 3000	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. System compliant to IHQ/DEE specifications EED-Q-071(R4), which may be obtained from IHQ MoD (N) on as required basis.				
47.	**Light Motors (>15KW)**	12.5	> 10000	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. System compliant to IHQ/DEE specifications EED-Q-071(R4), which may be obtained from IHQ MoD (N) on as required basis.				
48.	**Conversion machinery (Rotary convertors)**	12.5	> 120	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. System compliant to IHQ/ DEE specifications EED-Q-267, which may be obtained from IHQ MoD (N) on as required basis.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
49.	**Navigational lights & Control Panel (NLCP)**	12.5	> 50	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. System compliant to IHQ/DEE specifications EED-Q-262, which may be obtained from IHQ MoD (N) on as required basis.				
50.	**Helo Starting Rectifier**	12.5	> 50	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. Equipment compliant to IHQ/DEE specifications EED-Q-267 (R4) (Feb 15), which may be obtained from IHQ MoD (N) on as required basis.				
51.	**Automatic Change over switches (ACOS)**	12.5	> 600	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. System compliant to IHQ/ DEE specifications EED-Q-264, which may be obtained from IHQ MoD (N) on as required basis				
52.	**Auto Transfer switch (ATS)**	12.5	> 250	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. System compliant to IHQ/ DEE specifications EED-Q-264, which may be obtained from IHQ MoD (N) on as required basis				
53.	**Ruggedised UPS**	12.5	> 750	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies.				
54.	**Auto Emergency Lantern (AELs)**	12.5	> 20000	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. Equipment compliant to IHQ/ DEE specifications EED-Q-265, which may be obtained from IHQ MoD (N) on as required basis.				
55.	**Multi Cable Transit (MCT) Glands**	12.5	> 30000	POC- Cmde (EE) 011-23011668
Broad Parameters/Preferred Technologies.Specifications/Parameters approved by Class/Type approved, viz ABS,DNB, IRS, etc.				
56.	**Sound Power Telephone (SPT)**	12.5	> 50 sets	POC- Cmde (EE) 011-23011668
Broad Parameters/ Preferred Technologies. Equipment compliant to IHQ/ DEE specifications EED-50-08 (R2), which may be obtained from IHQ MoD (N) on as required basis.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
57.	**Remote Embedded System Support (RESS)**	8-10 Years	100	POC- Cmde (EE) 011-23011668
Broad Parameters/ preferred Technologies. Details may be obtained from IHQ MoD (N) on as required basis.				
58.	**Axial Flux Motors**	15-20 Years	Multiple quantities as per ratings/ applications	POC- Cmde (EE) 011-23011668
Broad Parameters/ preferred Technologies. Conventional Induction motors used onboard ships are Radial Flux Machines where in the magnetising flux is generated in a direction perpendicular to the shaft axis. Axial Flux Motors generate the magnetising flux in a direction parallel to the shaft axis. This design makes the motor power dense and compact. Axial Flux motors have a unique construction ensuring maximum Flux linkage and minimum flux leakage. Due to significantly low leakage flux, these machines offer significant size and weight advantages over conventional radial flux machines. This makes them an ideal contenders for replacement of heavy duty motors in restricted spaces with cumbersome shipping routes onboard ships.				
59.	**Inertial Energy Storage System**	10-15 Years	Multiple quantities as per ratings/ applications	POC- Cmde (EE) 011-23011668
Broad Parameters/ preferred Technologies. With the advancements in power electronics Inertial Energy Storage System (IESS) technology is being increasingly used as a replacement of batteries for energy storage devices. IESS comprises a high speed dual feed electrical machine coupled with a flywheel. IESS can be utilised for high power transitional power supply applications for safety critical equipment.				
60.	**Jetty based Mobile Cable Handling Assembly (MoCHA)**	10-15 Years	Multiple quantities	POC- Cmde (EE) 011-23011668
Broad Parameters/ preferred Technologies. The MoCHA is a jetty based mechanised shore supply cable handling assembly, which facilitates easy movement of cables between the jetty and ship for connecting up of shore supply cables.				
61.	**Integrated SATCOM Multifunction System (ISMS)/ Advanced Multi-function antenna system for Submarines**	15-20 Years	10	POC- Cmde (EE) 011-23011668
Broad Parameters/ preferred Technologies. Existing multifunction antenna systems onboard submarines support VHF, UHF, S-Band, GPS, IFF and AIS functionalities. However, there are separate antenna systems for VLF, HF and Satellite communication. In order to optimise the available space onboard submarines and obviate the requirement of towed wire antennas				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
for VLF communication, advanced multifunction antenna systems can be developed which support communication from VLF to K bands. Once designed and developed, these antenna systems can be configured to meet the requirements of submarines and well as AUVs/ UUVs.				
62.	**Modular ESM Receivers**	15-20 Years	100	POC- CMDE (EE) 011-23011668
Broad Parameters/ preferred Technologies. Modular design and BLI technology based ESM receiver for 18-40GHz frequency range is a likely field of interest to the IN as it aims to reduce the size of the antennae and provide the flexibility akin to a plug in module. Further, development of Base Line Interferometry (BLI) based low band antenna for ESM coverage for 175-500 MHz frequency band is also envisaged in the future. Participation of the private industry in development of such modular and technologically advanced systems is recommended.				
63.	**Indigenous Integrated Mast**	15-20 Years	50-70	POC- CMDE (EE) 011-23011668
Broad Parameters/ preferred Technologies. Design and development of an indigenous integrated mast, consisting of ELINT, COMINT, V/UHF and L Band transmitters in a single structure.				
64.	**Photonics based EW system**	15-20 Years	25	POC- CMDE (EE) 011-23011668
Broad Parameters/ preferred Technologies. Photonics-based EW systems have inherent advantages over conventional RF based systems, view low signal loss over long ranges. Feasibility of employing the technology in the domain of EW systems is proposed to be explored.				
65.	**Drone based ELINT Systems**	8-10 Years	10	POC- CMDE (EE) 011-23011668
Broad Parameters/ preferred Technologies. Drone based ELINT systems are planned to be inducted.				
66.	**Digital Beam Steering based Satellite TV**	8-10 Years	100	POC- CMDE (EE) 011-23011668
Broad Parameters/ preferred Technologies. The existing gyro stabilized satellite TV systems onboard ships uses a servo controlled mechanism to move the antenna which therefore has a short MTBF. To overcome the above, digital beam steering based satellite TV are planned for induction. Integrated system including Antenna Management Unit (AMU), tracking sensors, down converter and full RF front panel, with no moving part in Antenna sub assembly.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
67.	**Integrated Communication and Surveillance System for Submarines**	15-20 Years	16	POC- CMDE (EE) 011-23011668
Broad Parameters/ preferred Technologies. One of the most crucial aspects of submarine operations is the RCS when the submarine is at periscope depth. With the advancements in technology, there is requirement to minimise the number of masts which are protruding above the sea surface. In order to lower the probability of interception, there is a requirement to downsize and integrate sensor payloads so as to fit them on a single mast. The solution is expected to integrate optical surveillance R-ESM, C-ESM, SATCOM and communication antenna payloads.				
68.	**TR Modules**	15-20 Years	16	POC- CMDE (EE) 011-23011668
Broad Parameters/ preferred Technologies. IN is progressing a case for development of 'T/R module based EW systems, using Active Aperture Electronically Scanned Phased Array' for incorporation in indigenous EW projects. Involvement of Private industry is also solicited in the design and development efforts which is being progressed by DRDO. These modules are envisaged to be a game changer technology in the domain.				
69.	**Marine Automatic Weather Observation System (AWOS)**	10	10	POC- Cmde (NOM) 011-21610009
Broad Parameters/ preferred Technologies. Onboard IN ships, the system is required to provide receipt, processing, recording, display of Meteorological parameters viz. wind velocity & direction, atmospheric pressure, air temperature, humidity, cloud ceiling and visibility. The electronic interface and control unit of the system should process the recorded Met data for transmission to the ships distribution system viz IBS. It should also accept data from the distribution system such as ship's heading and speed for computation of true wind direction and speed. The Met data is required to be shown with the Master unit and multiple slave display unit. Marine AWOS system is expected to sustain in high sea-state and exposure to saline water conditions.				
70.	**PC Based XCTD system**	08-10 yrs	> 40	POC- Cmde (NOM) 011-21610009
Broad Parameters/ Preferred Technologies. The PC based Expendable Conductivity Temperature Depth (XCTD) system with ship borne receiving station and hand held XCTD probe launcher should be capable of recording of vertical profile of temperature, conductivity, depth, density and salinity up to a minimum depth of 1000 meters. Electromagnetic induction technology will be used for measurement of the conductivity. XCTD Probes should have shelf life of minimum 01 year when stored at temperature below 35^{0}C and humidity up to 99%.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
71.	**Compact Hydrogen Gas Generator for Upper Air Ascents**	10 - 15	09 for Naval Air Stations	POC- Cmde (NOM) 011-21610009
Broad Parameters/ Preferred Technologies. The requirement of system pertains to upper air ascents to obtain Met parameters viz wind velocity & direction, temperature and pressure undertaken by releasing Radiosondes with hydrogen filled balloons. To obviate the stowage of Hydrogen gas, which is hazardous in nature, an automated, safe, easy to operate and compact Hydrogen Gas Generator is required. The Generator should be able to produce at least 2.5 Cum gas in short span of time which is required to undertake one ascent.				
72.	**Digital Reference Barometer**	5	10	POC- Cmde (NOM) 011-21610009
Broad Parameters/ Preferred Technologies. For recording accurate barometric pressure in digital format with high accuracy. The instrument should be able to work for range of 850 to 1050 hPa or better. It should be light weight (not exceeding 5 Kg) and should have a provision to function on battery and main power supply.				
73.	**Gas Turbines (for Conventional Propulsion)**	As per OEM specification	45 - 50	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Mil-graded Marine Gas Turbines upto 40 MW capacity qualifying to IN specified shock standards. SBN requirements to comply with MIL-STD-740-2. ABN requirements iaw MIL-STD-1474D and suitable MIL standard compliant acoustic enclosures and Infra-Red Suppression Device to be provided. Complete set of skid mounted auxiliaries (intakes, exhausts, starter, fuel pump, lub oil storage and conditioning arrangement etc) to support the Gas Turbines. Integral Digital Fuel Control System compatible with IPMS. Control, monitoring and interfacing through IPMS Integrated Test facility for full load trials.				
74.	**Main Diesel Engine (for conventional propulsion)**	As per OEM specification	> 100	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Mil-graded Marine Diesel Engines of suitable capacity (derived from powering calculations) meeting IN specified shock standards. Meeting NES 313 or Class requirements based on platform specification. SBN requirements to comply with MIL-STD-740-2. ABN requirements iaw MIL-STD-1474D and suitable MIL standard compliant acoustic enclosures and Infra-Red Suppression Device to be provided. Control, monitoring and interfacing through IPMS. Class specification on mechanical vibration compliant to ISO 10816. Use of sea water based heat exchangers complying to NES 329.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
75.	**Gas Turbine/ Diesel Generator Set**	As per OEM specification	> 200	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Mil-graded/Class complying Generators powered by Marine Gas Turbines upto 40 MW capacity and/or Diesel Engines upto 12 MW capacity meeting NES 313 qualifying to IN specified shock standards. SBN requirements to comply with MIL-STD-740-2. ABN requirements iaw MIL-STD-1474D and suitable MIL standard compliant acoustic enclosures to be provided. Complete set of skid mounted auxiliaries (intakes, exhausts, starter, fuel pump, lub oil storage and conditioning arrangement etc) to support the Gas Turbines. Control, monitoring and interfacing through IPMS. Alternator to conform to EED-Q-242(R2). Integrated Test facility for full load thermal trials, Transient and M-Load Trials.				
76.	**Gear Box**	Ship's Life	100	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Main Propulsion Plant Gearboxes of suitable capacity approximately in the power output range of 1MW to 44 MW (derived from powering calculations) compliant to NES 305/Class Rules. Configuration of CODAD, CODAG, CODOG, CODLOG, CODLAG etc. Mounted assemblies include gearbox driven lub oil pumps, centrifuges for oil vapor separation, shaft locking and turning gear. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D, mechanical vibrations complying to ISO 10816. Meeting IN specified shock standards. Compatible with IPMS through serial/ ethernet link. PTO units may be mounted for some applications.				
77.	**Controllable Pitch Propeller (CPP) & Shafting**	Ship's Life	> 100	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. The main components of shafting system would include (but not limited to) thrust block, plummer block, bulkhead gland, shaft locking gear & turning gear, loose coupling, stern gland, stern tube bushes, 'A' bracket and/ or 'P' Bracket, eddy plate, rope guard, torsionmeter, thrust shaft, intermediate shaft & tail shaft and propeller. Compliance with IN specified shock standards, Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D, mechanical vibrations complying to ISO 10816. Extremely high reliability in performance throughout life cycle as shafting design is core to the ship. Low life cycle cost & durable life cycle support. High indigenous content (in design, manufacturing and propulsion system integration).				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
78.	**Integrated Platform Management System (IPMS)**	8-10	More than 50	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Engineering equipment and systems automation system. The IPMS should be based on VME 64 open architecture with distributed control system and dual redundant optical fibre network. Proprietary PLCs not to be used. Standardisation. Capable for integration with Integrated Bridge System (IBS), Addressable Fire Detection System (AFDS), Combat Management System (CMS), Battle Damage Control System (BDCS) through Gateways. Meeting IN specified shock standards.				
79.	**AC Plant**	14-18	> 220	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Central indirect AC plants utilising contemporary technology (magnetic bearing/screw compressors), catering to external environment of tropical conditions iaw Def Stan 02-102 (Part 1), Issue 3. Compressor capacity of approximately 100TR to 1000TR (would be based on platform requirements). The AC compressor should use R134A or a superior refrigerant. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification. Meeting IN specified shock standards.				
80.	**Steering Gear**	14-18	> 50	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Equipment matching contemporary global technology and compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. High efficiency and high power density. High reliability in performance through life cycle, increased MTBF, low MTTR (minimal downtime). Improved design to enable/ facilitate major repairs and maintenance in afloat conditions. Low life cycle cost and durable life cycle support. State-of-art VME 64 based control systems with advanced instrumentation. Standardisation. Indigenous system.				
81.	**Stabiliser**	14-18	45 - 50	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Equipment matching global technology and compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. High efficiency and high power density. High reliability in performance through life cycle, increased MTBF, low MTTR (minimal downtime). Improved design to enable/ facilitate major repairs and maintenance in afloat conditions. Low life cycle cost and durable life cycle support. State-of-art VME 64 based control systems with advanced instrumentation. Standardisation				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
82.	**High Pressure Air Compressors (HPAC)**	14-18	> 150	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Electric driven air compressors compliant to NES 315 of 30 bar to 280 bar output pressure and upto 12-14 LPM FAD. discharge capacity (would be based on platform requirements). Driers, filters and dehumidifiers are to be provided on the compressed air pipelines to eliminate moisture from air. The compressors will supply compressed air to the compressed air system at a final air temperature lesser than 43 deg C. compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. High efficiency and high power density. High reliability in performance through life cycle, increased MTBF, low MTTR (minimal downtime). Improved design to enable/ facilitate major repairs and maintenance in afloat conditions. Low life cycle cost and durable life cycle support. Standardisation.				
83.	**RO Plant**	14-18	> 200	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Equipment matching contemporary global technology, compliant with MIL standards & environmental norms. Capacity from 2 TPD to 200 TPD with modular design of purification modules to facilitate scaling (would be based on platform requirements). Compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations based on platform specifications. High efficiency and high power density. Low life cycle cost and durable life cycle support. High reliability, increased MTBF, low MTTR (minimal downtime). Preferably indigenous system or alternately high indigenous content with localized production. Standardisation.				
84.	**High Pressure (HP) Water Mist/ CO_2 System**	14-18	> 50	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Use of environmentally benign system compliant with MIL standards and has high efficiency. Extinguishing time preferably 120 seconds. Provisions for operation under blackout conditions. Highly reliable life cycle performance with low life cycle cost. Durable life cycle support. Modularity with standard as well as well-defined interfaces. Preferably indigenous system or alternately high indigenous content with localized production.				
85.	**Canned Motor Pump**	14-18	> 1000	POC- CMDE (ME) 011-23011713

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Compliant with MIL standards, high efficiency and high power density. Highly reliable and defect free performance through life cycle (specified period) with maximized MTBF and minimal MTTR (downtime). Compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. Low life cycle cost and durable life cycle support. Indigenous design, development & manufacture.				
86.	**Advanced Induction Motors, Propulsion Converters, High Voltage (HV) Switchboards and Variable Frequency Drives**	Ship's Life/As per OEM specification	25	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Part of Integrated Full Electric Propulsion/ Hybrid Electric Propulsion Plant. Capacity from 4MW to 20MW (would be based on platform requirements). Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.				
87.	**Centrifuges**	14-18	> 210	POC- CMDE (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Automated self/manual cleaning type centrifugal purifiers of varying capacity from 1 tph to 10 tph. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.				
88.	**Oxygen Generation Plant**	20	2 - 3	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technologies Supply Oxygen with 99.2 % purity at 220 bars with 5 to 8 micro meters fineness and a dew point of (-)63 deg C measured at 1 bar pressure. Capacity of minimum 30m^3/day at NTP with adequate storage arrangements. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.				
89.	**Nitrogen Generation Plant**	20	3-4	POC- Cmde (ME) 011-23011713

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Supply Nitrogen with 99.2% purity at 350 bar pressure and dew point of (-) 63 deg C. Capacity of minimum 30m^3/day at NTP with adequate storage arrangements. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.				
90.	**Restraining Gear**	20	3-4	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Mechanical, Structural and Hydraulic Modules with shock absorbers to assist in the take-off of Naval Carrier Borne Aircraft. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.				
91.	**Arresting Gear**	20	3-4	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Mechanical, Structural and Hydraulic Modules with wires to assist in the landing of Naval Carrier Borne Aircraft. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.				
92.	**Nuclear Propulsion for Future Aircraft Carrier and other Surface Combatants**	40	10	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technology. The existing naval propulsion systems viz Steam, Gas Turbines and Diesel Engines are well stabilised in Indian Navy. The changing international focus to combat climate change, rising cost of fossil fuel and the need for making ships stealthier and quieter with increased endurances, have led to a new revolution in the propulsion technologies. With the launch of nuclear-powered submarine INS Arihant in 2009 has marked a new chapter in the history of Indian Navy, propelling India into select club of nations with potential to construct nuclear submarines. Induction of same technology for aircraft carrier and surface ships will enable in achieving higher endurance, long reach and reduce carbon emissions.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
93.	**Electric Propulsion for *IN* Ships**	15	08	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technology. IN ships are installed with conventional propulsion comprising of Gas Turbines and/ or Diesel Engines. Further, IN is considering induction of Electric Propulsion for new future induction platforms. Accordingly, a case for indigenous design and development of Electric propulsion system was initiated under Make-I category. The technology for Integrated Full Electric/ Hybrid Propulsion is not available in India. The technology and associated systems have been installed onboard naval ships of developed countries and proven. The technology is also applicable to inland waterway transportation system in coastal areas				
94.	**Alternate Liquid Fuels for Marine Propulsion for Reducing Carbon Emission**	15		POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technology. Presently, Low Sulphur High Flash High Speed Diesel (LSHFHSD), a marine grade diesel oil are used onboard IN platform and is associated with carbon emission. Towards reducing the carbon footprint, an extensive study is being carried out worldwide for usage of bio-diesel in suitable blend in diesel engines. Development of alternate liquid to replace the marine grade diesel oil, as eco-friendly fuel in achieving significant reduction in carbon emission needs to be explored and implemented.				
95.	**Semi-Closed Part Electric Gas Turbine for Air Independent Propulsion**	15	10	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technology. Semi-closed electric gas turbines for air independent propulsion is still in the conceptual stage and studies on prototype are being progressed by developed countries. The technology has a huge advantage in terms of size and weight vis-a-vis power output and can bring in revolutionary change in the field of power generation for both land and naval application. Presently, the study are being progressed at academia level however, design and manufacture capabilities needs to be progressed simultaneously.				
96.	**Magneto Hydrodynamic (MHD) Propulsion for 'NIL' underwater Radiated Noise**	15	20	POC- Cmde (ME) 011-23011713

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technology. MHD is a technology in which the ships and submarines are propelled without a propeller. This technology provides a very high degree of stealth capability to the platform as there will be no underwater radiated noise by propellers. The research in the field is being progressed by developed nations and are at prototype stage.				
97.	**Acoustic Fixed Fire-fighting System**	15	20	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technology. IN ships are fitted with fixed firefighting system for machinery spaces for rapid extinguishing of fire by employing smothering and cooling effect. Presently, the system fitted onboard ships employ Halon and CO_2 gases as extinguishing agents, which are being phased out worldwide. Development of Acoustic extinguisher is being tried out to extinguish forest fire. In this technology, high pressure sound waves are used to displace the oxygen and extinguish the fire by smothering effect. A similar technology for ship application can be examined which will have high advantage over other fire fighting system as it will not have any residual deposits on other machinery system.				
98.	**AI/ ML based IPMS**	10	20	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technology. IPMS family of systems are being inducted onboard all future IN Ships. To enhance the existing features of IPMS and to transform the system into more interactive platform, AI/ML technology is envisaged to be absorbed in IPMS. While it is understood that AI/ML technology for marine application is in the nascent stages, the technological advancement it can offer cannot be overlooked. Accordingly, IN is looking at inclusion of AI/ML Predictive Maintenance tool in the IPMS SOTR to assist operator in taking decisive action in identifying defects, health monitoring and maintenance of machinery.				
MISSILES AND SYSTEMS				
99.	**Shore Based Missile**	25	100	POC-Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The missile should have a range of more than 250 km, for anti-ship role and capable of being launched from land based mobile launchers. It should have its own mobile integral radar and support complex. It should be capable of being redeployed at short notice.				
100.	**Helium Bottles**	10 years	04	POC- PDONA 011-20867293

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. The bottle contains helium gas at pressure of 255 bars. The pressure contained in the bottle acts on a piston which drives out the liquid (ballast oil) contained in the de-ballasting tank to enable floatation of the practice article and recovery on the surface after firing. The gas pressure is imposed on piston on Ignition of the pyrotechnical valve punch. Volume of the bottle: 33.7 Litres. Length: 543 mm; Composition: light alloy; Max Pressure rating 385 bars. Wt. 53 Kg; Dia 353 mm.				
101.	**TLT cable**	10 years	30	POC- PDONA 011-20867293
Broad Parameters/ Preferred Technologies. It is multi-core cable used for transmitting data between onboard firing control system and missile. There are connecters and special plugs at both ends of the cable. Length 2023 CM.				
102.	**VSM central Tube**	10	15	POC- PDONA 011-20867293
Broad Parameters/ Preferred Technologies. A cylindrical tube manufactured by winding epoxy resin impregnated carbon fibres. Each end is equipped with a metallic shroud. It is part of outer body of submarine launched missile. Length: 4285 mm; Diameter: 533 mm; Thickness: 18 mm; Weight: 204 Kg.				
AMMUNITION				
103.	**Standoff Guided Bombs**	15	650	POC- Cmde (NAS) 011-26771576
Broad Parameters/ Preferred Technologies. High precision standoff guided Bombs to be employed for deck based fighters. The Bombs need to be designed with range extension kits ie, either propelled or winged to provide good standoff launch ranges. The bombs are required to be designed with laser or IR as terminal guidance and INS + satellite for mid-course guidance. They should be capable of day and night operations and targeting land and afloat targets (stationary and mobile). **Remarks by DRDO – Developed**				
104.	**Insensitive Ammunition**	35	2000	POC-Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. IM composition to comply with NATO Standard STANAG. Enhanced safety with equivalent end use performance, minimal severity and hazard effects on inadvertent initiation. Performance at par with conventional explosive filled warhead.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
105.	**Guided Ammunition for 76 mm and above**	25	4000	POC-Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The ammunition should have a range of not less than 50 km with seeker, control system and suitable fuse and warhead for capability against missiles, aircraft, ships, amour, ground targets and personnel.				
106.	**ER Guided Munitions (127 mm and above)**	25	2000	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The ammunition should have a range of not less than 70 km with seeker, control system and suitable fuse and warhead for capability against missiles, aircraft, ships, armour, ground targets and personnel.				
107.	**Active Off-Board Decoy**	25	More than 100	POC-Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The decoy should be launched from existing Chaff systems of ships with 105mm caliber. It should have a persistence time of not less than 10 min. It should be able to mimic RF transmissions of Anti ship missiles and provide alternate/ larger target to seduce the missile. Persistence time of 25 min. **Remarks by DRDO – Under development**				
108.	**Fuzes for 76 mm Guns and above**	25	20000	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. Fuses for use against missiles, aircraft, ships and ground targets for 76mm guns and above.				
SENSORS				
Radars				
109.	**Multi-functional Dual Band Radar**	15	40	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The radar should provide air and surface surveillance and also be capable of controlling delivery of ordnance (Missiles and Guns). It should be phased array radar with electronic beam steering and stabilisation capability. It should be modular and easy to maintain and be able to be fitted onboard ships of 1000 GRT and above. Low Probability of Intercept.				
110.	**Doppler Weather radar 'X' band**	15 yrs	> 15	POC- Cmde (NOM) 011-21410476

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Technologies. For fitment on platforms capable of operating aircraft. Weather RADARs help in forecasting and in identification of approaching storms. This equipment is required for Aircraft carriers and all platforms having integral Helos. The Marine version of 'X' Band weather RADAR should weigh less than 01 Ton; operate within the frequency of 0.8-1.0 GHz and be capable of being installed on any lattice mast onboard ships. The typical range of the radar should be at least 100 km with an antenna size of 2.0 m approx.				
111.	**Airborne AESA radar for Fighter aircraft with Swash Plate- Field of View ± 100^0**	25 yrs	40	POC- Cmde (NOM) 011-21410476
Broad Parameters/ Technologies. The fighter aircraft are equipped with airborne interception radar. The indigenous radar developed by DRDO is Uttam AESA radar which has a look angle of ± 60^0. However, contemporary fighter aircraft of the world like Eurofighter, Gripen and F-35 are equipped with AESA radars that have a look angle of + 100^0. These radars utilise GaN based T/R modules to enhance thermal efficiency and a swash plate for enhanced Field of View (FoV). Development of this capability will create major export avenues for India.				
Sonars and Sonobuoys				
112.	**Submarine Sonar Suite**	25	10	POC – Cmde (SMAQ) 011-23011067
Broad Parameters/ Preferred Technologies. Integrated sonar suite will consist of Passive Sonar, Active Sonar, Intercept Sonar, Winch – able passive Towed Array Sonar, Mine Avoidance Array (MAA) sonar for Mine Avoidance functions, Sound Velocity Recorder, Underwater Telephone with NCO capability, SIP with DEMON and LOFAR analysis, Sonar Simulator, Flank Array Sonar and Built – in test equipment. **Remarks by DRDO – Developed**				
113.	**DIFAR/DICAS/Bathy Sonobuoys**	10		POC- Cmde (NAS) 011-26771576
Broad Parameters/ Preferred Technologies. Since the project is being pursued by NPOL, the numbers would be decided on success of TD project. Sonobuoys must have the facility of command functions like toggle VHF Tx power on/ off, change of RF channel and depth variation of hydrophone. There are three types of the sonobuoys as per slandered NATO nomenclature viz, DIFAR – passive directional buoy, DICASS – active sonobuoy that is command activated and Bathy buoy – that generated temperature/ velocity profile of sea water upto a specified depth (400-600 m) The sonobuoys should be considered for development for both Eastern and Western origin aircraft. The development of the sonobuoys could be based on the existing design with better sensor performance and utilise the existing drop system. **Remarks by DRDO – Under development**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
114.	**Sonar Transducer with Polyurethane Element**	10	25	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. Sonar transducer based on composite materials that give high radiation of power for a given surface area as well as design of desired projector shapes. The transducer should be capable of generating/ receiving the power in the frequency range 3-4.5 Khz. The gain in power should be at least 50% more than the present sonars in the IN.				
115.	**Low Frequency Bow Mounted Arrays**	20	More than 10	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The array is envisaged to operate in frequency between 2- 3 KHz. The array size should be optimized for installation onboard Frigates and Destroyers without affecting their draught and design aspects. The array should be capable of integration with processing system in IN after minimal changes. The array should be able to be installed onboard Destroyers and Frigates in-service within the constraints of the extant sonar dome area. **Remarks by DRDO – Under development**				
116.	**Thin Line Array**	15	20	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The thin line array should be less than 55 mm in dia and capable of being operated by vessel of less than 100 tons. Should be capable of detecting conventional submarine in littorals (within 200 m of depth). The array along with workstation should be portable in nature such that for each deployment the system should be capable of being shifted from shore based stowage to towing unit. The array should operate in frequency range from 100 to 5000 Hz and have requisite classification tools. The array should be able to undertake bi-static operations with low frequency transmissions being undertaken by separate source in frequency range of 3000 - 5000 Hz. ***Electro Optics**. In addition to the equipment listed below, electro optics technology has also been sought for systems and platforms included elsewhere in this TPCR like **tanks, aircraft, RPAs etc**.*				
117.	**EOIRST**	15	100	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The system should be able to carry out passive search, detection and tracking of air and surface targets with day and night capability using its thermal imagers, CCD cameras and Laser Range Finders even under conditions of zero visibility. It should provide detection of small surface targets in search mode at greater than 20 km. **Remarks by DRDO – Under development**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
118.	**Long Range Electro Optical Sensors**	10	200	POC- Cmde (NAS) 011-26771576
Broad Parameters/ Preferred Technologies. A Gen 4 multi sensor EO/IR payload for helicopters, RPAs and MR aircraft. The system should essentially conform to all the features of a modern system with good standoff ranges. High definition Low Light TV, IR sensor and a telescopic type sensor for long range detection should also be incorporated in the system. The display should have the capability to present an integrated output to the operator. **Remarks by DRDO – Under development**				
CBRN AND FIREFIGHTING				
119.	**Addressable Flood Alarm System (AFAS)**	15	60	POC- Cmde (NBCD) 011-23793514
Broad Parameters/ Technologies. Advance system with Ethernet connectivity for instant detection and feedback system of water ingress. To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available.				
120.	**Addressable Fire Detection System (AFDS)**	15	60	POC- Cmde (NBCD) 011-23793514
Broad Parameters/ Preferred Technologies. Advance system with Ethernet connectivity for instant detection and feedback of smoke/ flames. To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available. **Remarks by DRDO – Developed**				
121.	**Magazine Fire Fighting System (MFFS)**	20	> 100	POC- Cmde (NBCD) 011-23793514
Broad Parameters/ Preferred Technologies. Automatic fire/ smoke detection system for magazines based on Ethernet connectivity for real time detection and feedback and activating of fire extinguishing measures. **Remarks by DRDO – Developed**				
122.	**DC Training Facilities**	25	3-4	POC- Cmde (NBCD) 011-23793514
Broad Parameters/ Preferred Technologies. To undertake training on Fire Fighting and Damage Control under simulated conditions of ships.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
123.	**FF Training Facilities**	25	3-4	POC- Cmde (NBCD) 011-23793514
Broad Parameters/ Preferred Technologies. To undertake training on Fire Fighting and Damage Control under simulated conditions of ships.				
EW AND COMMUNICATIONS				
124.	**Communication System and sets for Submarines**	25	>10	POC- Cmde (SMAQ) 011-23011067
Broad Parameters/ Preferred Technologies. *(a) Advanced Composite Communication Suite with transmitter/ receiver integrated and intelligent communication control* *(b) TWA & TSCB for dived V/UHF/HF/VLF/GPS/IRNSS/ SATCOM.* *(c) Satellite communication system, with Ku Bank 'S' Band and UHF capability 'L' Band capability for 'Technical Communications with SDRs'.*				
125.	**Tethered Submarine Buoy**	25	>10	POC- Cmde (SMAQ) 011-23011067
Broad Parameters/ Preferred Technologies. Technology to ensure a payload having capability for V/UHF, SATCOM, GPS, L-Band etc.				
126.	**INMARSAT Maritime voice cum high speed data terminal (FBB 500)**	15	> 50	POC-PDNSO 011-23015216
Broad Parameters/ Technologies. For fitment on various types of Ships.				
127.	**Laser Based Communication Systems**	12 - 15	30 to 40	POC- PDNS 011-23011445
Broad Parameters/ Preferred Technologies. The communication system would provide secure two way communications between naval units.				
128.	**High Power HF Broadcast System**	15	50	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. 10 KW high power HF broadcast system for shore based communication stations to meet the ship shore/ broadcast requirements of Indian Navy. The set should provide both voice and high speed data communications. The set should also incorporate the latest technologies in the field of HF communications including ALE.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
129.	**Multi-Function Antenna (MFA)**	15	30	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. The MFA should provide a modem, reliable system based on the latest technology in communication system engineering. It should support high level of integration in both narrow band and wide band, providing requisite Quality of Service (QoS) for speech, data and video. The system should cover the full spectrum of radios (V/UHF & L Band), Satcom (S & UHF Band) and integration of 3rd party external communication requirements. MFA should be capable of concurrent operation of ELINT, COMINT along with V/UHF/L Band communication equipment without any interference.				
130.	**Free Space Quantum Communication System**	10	05	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. The system should provide secure communication between ships and shore establishments utilising quantum technology.				
131.	**Cognitive Radio**	12	250	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. Multi Channel SDRs with advanced features of wide band Multi Net MANET and Cognitive Features for ships, submarines and Naval Bases. The sets should provide secure voice, data and Mobile Adhoc Networking waveforms including AJ features compatible with existing IN SDRs.				
132.	**Software Defined Radio for Ships and Submarines**	10	150	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. Multi Channel, multimode and modular secure SDRs for Ships and Submarines in V/UHF and L band to meet secure voice, data and NCO requirements. The radio should provide secure voice, data and Mobile Adhoc Networking waveforms including AJ features, wide band Multi Net MANET and also offer compatibility with existing IN SDRs and legacy radios. The radios will be required to be interfaced with ship/submarine borne systems.				
133.	**AI/ML based Emitter Identification System**	7	100	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. The Application should be able to classify platforms and emitters and discriminate critical threats on the go from live ELINT/ ESM inputs. Based on data analysis, the application should provide suitable result on best matched emitter, based on previously learnt attributes/ patterns as per the database. Emitter based fingerprinting techniques may be explored/ incorporated for EOB analysis.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
134.	**Tethered Drone based lightweight EW system**	15	20	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. Unmanned airborne electronic surveillance system comprising light weight ELINT and COMINT payload mounted on a Tethered Unmanned Aerial Vehicle for complete spectrum visibility at sea. The system should have capability to simultaneously monitor and DF multiple RF Signals (both Radar and Radio). It should provide capability to the operator onboard ship to seamlessly scan, detect, monitor, DF, demodulate, record and playback signals through Integrated Ground Control Station.				
135.	**IN-FFC Communication System**	10	75	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. The IN-FFC Secure Communication System is envisaged to provide timely and secure information sharing over internet/ RF medium through the use of e-mail, instant messaging or chat, web services and voice calls over IP. The exchange of information is to be over Internet/ RF medium with suitable robust encryption device/ security module that is capable of securing classified info during inter-Govt. HQ-HQ communication and also during tactical operations at sea.				
136.	**4G/ 5G Based Tactical Communication System**	05	100	POC – Cmde (NS) 011-21410645
Broad Parameters/ Preferred Technologies. A tactical LAN system based on 4G/ 5G technology for use onboard ships/ submarines/ aircraft. The system should be modular in design to be able to be fitted on various platforms. Different form factors may need to be developed. The system should be capable of range extension through integration with SATCOM network/ RF network.				
137.	**Mobile MTS** (Main Transmission System) **for VLF Transmitters**	15	01	POC – Cmde (Amber) 011-21410466
Broad Parameters/ Preferred Technologies. 100-250 KW high power Mobile MTS VLF Transmitter System for ship/ submarine based communication to meet the emergency shore - ship broadcast requirements of Indian Navy. The system should provide high speed data communications and be compatible with the static VLF transmission antennae of IN. The system should also incorporate the latest technologies in the field of VLF communications.				
138.	**AI/ ML Enabled Maritime Data Analytics Tool**	10	01	POC – Cmde (NCO) 011-2086330

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. The requirement is to develop a platform that will integrate maritime data from various sources online/ provided by IN, and use data science to automatically alert the user about suspicious activities in the maritime domain. The platform is also to provide tools to detect and analyse vessels of interest and Dark Ships. A machine learning/ AI based platform for carrying out analytics on AIS and other ship position data to assist users in identifying Vessels of Interest and suspicious activity.				
139.	**EO and SAR**	10 – 12	12 - SAR 12 - EO	POC - Cmde (NSO) 011-23010238
Broad Parameters/ Preferred Technologies. IN would require wide-swath EO and SAR satellites for open oceanic surveillance. SAR satellites could carry an additional Automatic Identification System (AIS payload) for identification of ships at sea. The data generated by these satellites would need to be fused and analysed together to generate 'pattern of life' at sea and detection/ identification of vessels at sea. A suitable AI/ ML based solution would be needed for the same. Recommended swath for the EO and SAR satellites would be as follows: - *(i) EO Satellites – Minimum 100 Km X 100 Km* *(ii) SAR satellites –Minimum 300 Km (AIS Payload)*				
140.	**RF Monitoring Payload**	10 – 12	06 Clusters (03 satellites each)	POC - CMDE (NSO) 011-23010238
Broad Parameters/ Preferred Technologies. The generic system design should provide near real time surveillance and monitoring of 'Emitters of Interest' in the global/specific Area of Interest (AoI) for detection, location, recording and analysis of intercepted data. This would require multiple satellites/ constellation to cover the Indian Ocean Region catering for redundancy for individual satellites with overlaps in coverage and have wide swath and Field of View (FoV). The constellation should cater for a very high Probability of Intercept with high sensitivity and DF accuracy (TDOA) in the frequency spectrum ranging from V/UHF to the Ka band. Further, a mechanism comprising Ground segment including secure network for transfer of data to the concerned naval operations centre/s, AI based software for analysis of ELINT data and further disseminating to naval platforms would also need to be catered.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
141.	**OFC Network devices and equipment viz DWDM , FDMS, FTMS, HPDE Ducts, OTB, TMFOC , Jetty Enclosures, ONIT, Electronic Route Locator, FIPS and other association OFC utility equipment/ devices**	10	OFC Equipment required for 5000 Km network	POC - Cmde (NSO) 011-23010238
Broad Parameters/ Preferred Technologies. Equipment to be compliant with latest IEEE/ TEC GR/ TIA standards, which may be obtained from IHQ MoD(N) on as required basis.				
142.	**Networking Devices viz Servers, Switches, Routers, Load balancers, Racks and other associated Data Centre Infra component**	7	8000 networking devices and associated data centre devices	POC - Cmde (NSO) POC – 011-23010238
Broad Parameters/ Preferred Technologies. Equipment to be compliant with latest IEEE/ TEC GR/ TIA standards, which may be obtained from IHQ MoD(N) on as required basis.				
143.	**Network Security Appliances viz Firewall, IPS/ IDS, AV, DLP, APT and other contemporary network security appliances.**	7	Appliances for 4 data centres	POC - Cmde (NSO) POC – 011-23010238
Broad Parameters/ Preferred Technologies. Equipment to be compliant with latest IEEE/ TEC GR/ TIA standards, which may be obtained from IHQ MoD(N) on as required basis.				
144.	**Network Management and monitoring Appliances viz UNMS, SIEM, EMS, NMS, NAC and other contemporary network security appliances.**	7	Appliances for 4 data centres	POC - Cmde (NSO) POC – 011-23010238

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Equipment to be compliant with latest IEEE/ TEC GR/ TIA standards, which may be obtained from IHQ MoD(N) on as required basis.				
145.	**Voice/ Video Solution with IP/ video phones, VOIP gateway, Analog gateway, MDF/ IDF, VC solution with Telepresence**	7	50000 devices	POC - Cmde (NSO) POC – 011-23010238
146.	**Bulk Encryptors**	7	1000	
Broad Parameters/ Preferred Technologies. Equipment to be compliant with latest SAG guidelines and specifications, which may be obtained from IHQ MoD(N) on as required basis. **Remarks by DRDO – Developed**				
147.	**Private Enterprise cloud solution**	7	As applicable for hosting IN applications	POC - Cmde (NSO) POC – 011-23010238
Broad Parameters/ Preferred Technologies. Equipment to be compliant with ISO 270001 standards, which may be obtained from IHQ MoD(N) on as required basis.				
INFRASTRUCTURE				
148.	**Modernisation/ Augmentation of facilities at Naval Dockyards and Naval Ship Repair Yards**	15-20	Miscellaneous	POC- Cmde (DODY) 011-21410480
Broad Parameters/ Preferred Technologies. Equipment for proving shore support to ships and submarines, viz mobile cranes, material handling equipment, air compressors, rectifiers, transformers, etc.				
149.	**Installation of Major FF Systems in Naval Jetties**	15-20		POC- Cmde (DODY) 011-21410480
Broad Parameters/ Preferred Technologies. Foam based heavy duty firefighting systems both in fixed and mobile configuration. Capable of operation in marine environment.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
MATERIALS AND PAINTS				
150.	**Active Mounts for Machinery**	7-10	More than 10 sets	POC- Cmde (ME) 011-23011713
Broad Parameters/ Preferred Technologies. Development and effectiveness of mounts for speed dependent machinery to achieve attenuation of low frequencies (< 50 Hertz) of vibration across mounts. The life span and maintenance envelop of Active Mounts is desired to be enhanced than the existing S&V mounts being utilized below equipment/ machinery onboard ships/ submarine.				
151.	**Paints / Coatings**	7-10		POC- Cmde (NA) 011-21410483
Broad Parameters/ Preferred Technologies. Development of Broad band Radar absorbing coating and composites using nano materials which is resistant to seawater immersion, Density <2.5 g/cc and > 10dB attenuation in the frequency range 2-40 GHz. The life of the coating / material should be greater than 7 years.				
152.	**Radar Absorbing Paint**	>5	20 aircraft	POC- Cmde (APP) 011-26771521
Broad Parameters/Preferred Technologies. The return loss properties envisaged over flat composite panels are more than 5 dB Over 3-8 GHz and More than 10 dB over 5-7 GHz. Desired technical specification are as follows:- *(a) Thickness = 1.3+/- 0.1 mm* *(b) Weight = 3.5 Kg/m^2* *(c) Life = Not less than 5 years* *(d) curing one application job = Not more than 03 weeks* *(e) Variation in thickness = Not more than 100 ucrons*				
MISCELLANEOUS				
153.	**Decoy for Wake Homing Torpedo**	20	More than 500	POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The decoy for wake homing torpedo should be expendable in nature and capable of seducing modern wake homing torpedoes. The decoy should be capable of deployment from Maareech Launcher. The same decoy should be capable of seducing active/ passive homing torpedoes.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
154.	**Demilitarization Plant for Explosive Disposal**	20	01	POC- PDONA 011-26192845
Broad Parameters/ Preferred Technologies. De-militarization plant is to cater for disposal of Naval explosive stores which have been declared obsolete/ unserviceable for further use. *(a) Warhead of missiles, Torpedoes, Rockets, Mines etc weighing from 1 kg to 700 kgs (NJet Explosive Content) and 1000 Lbs.* *(b) Small arms ammunition of caliber ranging from 5.56 to 20mm.* *(c) Naval Gun Ammunition from 20 mm to 130 mm caliber.* *(d) Propellant of various sizes (pellet, grains, sticks etc).* *(e) Rockets I chaff ammunition of caliber ranging from 100 to 140 mm.* *(f) System should be capable of delivering the output materials (scrap) from the disposal process to segregate separate its basic components like brass, steel. Aluminum etc.*				
155.	**Hydrogen Generator for IN Met Offices**	12 Yrs, extendable up to 15 years with upgrades	>30	POC- Cmde (NOM) 011-21410476
Broad Parameters/ Preferred Technologies. Hydrogen Gas Generator for use with UASS. *The upper atmospheric observations are taken by attaching Radiosondes to hydrogen filled balloons and releasing them. To ensure availability of hydrogen onboard, a safe and environmental friendly hydrogen generation system through electrolysis technology is required for all ships installed with UASS. The Hydrogen generation cabin will have spark proof fittings and facility of direct fresh water source. The Hydrogen generator, which is an integrated and automated system, would be in a site-ready enclosure. The generation of Hydrogen should be made through caustic free Proton Exchange Membrane (PEM) which is environment friendly and compact. The system should operate under standard electrical conditions and have adequate inbuilt safety features.*				
156.	**High Power Computing System INMAC NODPAC**	10	01 system	POC- Cmde (NOM) 011-21410476
*Broad Parameters/ Preferred Technologies. A high performance computing system (HPCS) with associated equipment, for Indian Naval Meteorological Analysis Center (INMAC) for numerical Prediction to be procured for the operation run of high resolution Numerical Weather Prediction (NWP) Models on 24x7 basis. Should have proven architecture based on high availability to provide sustained high-level of uptime (**99% or more**) and throughput (high sustained G Flops, high I/O bandwidth etc.).*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
157.	**Store/Ammunition Lift**	25	10	POC- Cmde (NA) 011-21410483
Broad Parameters/Prefered Technologies. For transfer of stores/ ammunition between decks on ships.				
158.	**Turn Table**	30	06	POC- Cmde (NA) 011-21410483
Broad Parameters/Prefered Technologies. For revolving aircrafts onboard operated on board IN aircraft carriers.				
159.	**All Electric 11m Work Boat**	10	04	POC- Cmde (NA) 011-21410483
Broad Parameters/Prefered Technologies. All electric 11m Work Boat with superior torque/ instantaneous speed, improved maneuverability and stability for operation in restricted waters at harbour/ ports. Further, use of solar panels to supplement the electric propulsion may also be explored.				
160.	**Next Generation Helo Harnessing and Traversing System**	30	42	POC- Cmde (NA) 011-21410483
Broad Parameters/Prefered Technologies. System for harnessing and traversing on the Helo deck of ships compatible with IN operated helicopters.				
161.	**Conveyer System for Material Movement between Jetty & Ship**	10	02	POC- PDONA 011-20867293
Broad Parameters/ Preferred Technologies *(a) Material movement both ways from Jetty to Ship and Ship to Jetty with rollback protection.* *(b) Automated system which can be operated by two users.* *(c) Low cycle time loading to faster turnaround time.* *(d) Robust, reliable & safe.* *(e) Suitable structure and material to endure normal seaside weather conditions.* *(f) Suitable 3-axis compensation to counter normal sway of ship (due to sea water turbulence).*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
162.	**Conveyer System for disposal of unserviceable Ammunition from Ships**	10	10	POC- PDONA 011-20867293
Broad Parameters/ Preferred Technologies. *(a) The system will dispose of ammunition in sea with a safe horizontal disposal distance of 3 m from the ship deck edge.* *(b) The system will withstand a maximum to take loading of 1000 qty at any point of time.* *(c) The system will be loaded on the ship using crane.* *(d) The system will be able to handle ammunition & bombs up to 1200 mm length, 750 mm diameter/ width/ height.* *(e) The system shall be in operation only during the normal ambient condition viz good visibility, normal wind, no turbulent tide, stable ship etc.*				
Project to be included under a new category of Unmanned Systems				
163.	**Lightweight AUV (L-AUV)**	15	20	PCO – Cmde (SR) 011 – 26771553
Broad Parameters/ Preferred Technologies. L-AUV is envisaged to be a UUV of less than 250kg. L-AUV should be capable of undertaking MCM, ISR, IW/ Deception/ EW and Combat Support missions.				
164.	**GRSE**	-	-	PCO – Cmde (SR) 011 – 26771553
Broad Parameters/ Preferred Technologies. Inclusion of man portable AUVs (MP-AUVs) for the Indian Navy. The MP- AUVs can have multiple roles based on payload, including mine detection, surveillance, autonomous decoy, loitering ammunition,, bathymetry etc. Further, the MP-AUVs can be deployed in swarms to provide maritime domain awareness.				
SPECIAL PROJECTS				
165.	**Avionics, sensors and role equipment for aviation platforms.**			
Broad Parameters/ Preferred Technologies. ***Details can be obtained from Naval HQ.***				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
166.	**New generation aircraft viz TEDBF (Twin Engine Deek Based Fighters), LCA (Navy) and their associated sensors and avionics**			
Broad Parameters/ Preferred Technologies.	***Details can be obtained from Naval HQ.***			
167.	**DBMRH (Deck Based Multi Role Helicopters and Utility Helicopter (Maritime (UH-M)**			
Broad Parameters/ Preferred Technologies.	***Details can be obtained from Naval HQ.***			
168.	**Expendables including Sonobuoys**			
Broad Parameters/ Preferred Technologies.	***Details can be obtained from Naval HQ.***			
169.	**Air Deployable rafts for SAR role**			
Broad Parameters/ Preferred Technologies.	***Details can be obtained from Naval HQ.***			

TPCR 2025
INDIAN AIR FORCE

1. The Indian defence and aerospace industry eco-system is on the cusp of a transformation and is spearheaded towards establishing its footprint in the global defence sector. In line with the Government's 'Make in India' programme, various policy frameworks and initiatives adopted towards achieving self-reliance in Aerospace and Defence sector has resulted in a significant shift from largely import-dependent to a globally competitive industry. India's growing importance in the global defence sector has also encouraged collaboration with foreign industries to undertake co-development, transfer or technology, and manufacturing in India.

2. The IAF, guided by its doctrine, is steadfastly embracing the future by harnessing advanced technologies that promise to reshape the nature of modern warfare. With a firm commitment to maintaining air superiority and adapting to the evolving security challenges, the IAF's future technologies outlook embodies the essence of its doctrine: dominance of the air, joint operations, flexibility, and information superiority. This visionary roadmap provides Indian industries with a comprehensive understanding of the technological capabilities the IAF requires in the next 10-15 years. It emphasizes the need for cutting-edge systems and technologies that enable the IAF to establish and maintain air superiority over adversaries, projecting power and protecting national interests.

3. By engaging Indian industries and fostering collaborative innovation, the roadmap sets the stage for a technologically advanced and operationally agile IAF, equipped to address future challenges and protect India's national security interests with precision and effectiveness. IAF is confident that the Indian defence industry partners will aggressively focus their efforts towards building their capability to realise the vision of Atmanirbhar Bharat.

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
COMMUNICATION SYSTEMS				
1.	**IAF Strategic Communication Network with Indian Security Protocol**	10-15 Yrs	Lot	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred technology. *(a) The project is to establish a secure communication grid to integrate weapon systems, air-defence elements, data-centres and end-users. The Secure communication Grid should have required components to establish a packet switching core using standardized protocols and interfaces to support routing and transport of IPv4/IPv6 packets between various elements in a reliable manner. In addition to the forwarding plane, the Grid should provide distributed computing infrastructure using open source cloud*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
or containerization technology to run application stack, applications related to operations and various enterprise applications to handle techno-logistics and administrative requirements. All security elements should be Indian. *(b) The network should have a secure wire line and wireless access segment to provide connectivity to end users deployed within various airbases, command and control centres and headquarters. The end user connectivity must support digital voice as well as data services offered in an integrated or segregated manner.* *(c) With the evolution of Internet technology to Web 2.0 and to 3.0 in near future, the connectivity and computing landscape is likely to witness a significant technology transition. Applications and weapon systems of the future expects support for high to ultra-high bandwidth in the access/core, low-latency network connectivity, near zero-loss of packet in the core, and integrated security at every stage. Therefore, the offered technology is expected to be compliant to these requirements.*				
2.	**Zero Trust Network Access (ZTNA) Model**	10-15	Lot	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. Zero trust is a technology that ensures end to end security on hybrid network with a highly distributed workplace. Implementing an indigenously developed ZTNA solution implies preventing unauthorized nodes and users from being able to communicate with or even detect protected systems. The ZTNA concept will replace the aging VPN infrastructure and will assure security as a part of an overall Secure Access Service Edge (SASE) architecture.				
3.	**Space/Air to Ground High Speed Communication System**	25-30	50	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The system should be able to operate at the enhanced data rate of 1 Gbps. The system should be lightweight and have low power requirements. The system should be easily integrated into existing assets of IAF. The system is preferred to be utilized on RPAs, AWACS, AEW&C etc. The system should be capable to transmit both voice and data in secure and legacy mode. The system should have anti-jamming capability.				
4.	**Development of Indigenous Joint Waveform for Software Defined Radios**	20	Lot	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. Software Defined Radios (SDR) are being inducted into IAF for secure voice and data communication. In integrated battlefield scenario, SDRs of all three services need to communicate for better Situation Awareness (SA) and tactical Ops. A joint waveform is required to be developed for SDRs employed in all three services. The waveform should be compatible with already inducted SDR sets. **Remarks by DRDO – Under development**				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
5.	**Unidirectional Security Gateway**	5-10 Yrs	200	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. *(a) Unidirectional Security Gateway hardware is physically able to transmit information in only one direction.* *(b) Software connectors of unidirectional security gateway should replicate servers and emulate devices. Users and applications on the destination network should interact normally and bi directionally with faithful replica systems.* *(c) The unidirectional security gateway connectors should support integration with various OS platforms (e.g. Linux, Solaris, Unix, MAC OS and Windows) and virtual machine platforms (e.g VMware, Virtual box, QEMU and Hypervisor).*				
6.	**Mobile SATCOM & TROPO Terminal (MSTT)**	15-20	150-200	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. Containerized, vehicle mounted, to be all terrain capable, off road capability and the equipment must be deployable at terrain upto 5000 mtr AMSL. They must have high band width for supporting data transfer. Also, they must have adequate encryption / ECCM facilities. Maintenance requirements must be minimal.				
7.	**Indigenous Secure ADS-B in & out**	10-15	3000	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The unencrypted nature of ADS-B communication poses an operational security risk to military aircraft conducting sensitive missions. Format-Preserving Encryption (FPE), an advancement in cryptography, provides the ability to encrypt arbitrarily formatted data without padding or truncation. An indigenous cryptographic module employing any of the FPE algorithms may be used to encrypt the ADS-B equipment. Thus a system employing this technique may be developed for military aircraft.				
8.	**Plug and Play Telemetry Solutions for Flight Test Requirement**	10-15 Yrs	Lot	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred technology. The project is to enable easy Flight Test Instrumentation and Telemetry capability to the prototype and in-service aircraft of the IAF. The Telemetry System must be minimalistic in terms of the mechanical and electrical integration requirements from the aircraft. The system must be preferably self-powered with mounting provision to external to the aircraft. Basic flight parameters, attitudes, rotation angles, rotation rates, acceleration, angle of attack, side-slip and GPS parameters are required to be recorded in a standalone mode and system must be capable of real time transmission of the data to ground stations.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
		ELECTRONIC WARFARE		
9.	**RWJ for DARIN-III Jaguar**	10 Yrs	56	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Internal Radar Warner Jammer (RWR 1-40 GHz and jamming 5-18 GHz) along with associated ground support and ground handling equipment for upgraded Jaguar DARIN-III aircraft is required for carrying out active ECM missions. RWJ is required with appropriate clearances before trials. The RWJ should be integrated with onboard avionic systems. It should not alter or cause limitation on flight envelope of the aircraft. RWJ pod should have adequate electronic radiated power (ERP) to ensure jamming of airborne radars from longer distances.				
10.	**ASOJ**	20 Yrs	12	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Airborne Stand-Off Jammer operating in 0.5 to 40 GHz range mounted on or inside transport aircraft to carry out electronic counter measures mission along with associated ground support and ground handling equipment are required. System should be capable of jamming ground based/ airborne emitters from the range of more than 350 km. System should be self-sufficient for obtaining radar warning. It should not alter or cause limitation on flight envelope of the aircraft.				
11.	**Ground Based Multipurpose Jammer**	20 Yrs	12	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Ground Based Multipurpose Jammer operating in 0.5 to 40 GHz range mounted on missile vehicles to carry out electronic counter measures mission along with associated support and handling equipment are required. System should be capable of jamming ground based/airborne emitters from a range of 500 Kms. System should be self-sufficient for obtaining ELINT. Under Make-I category				
12.	**Airborne GPS Jammer**	20 Yrs	12	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Airborne GPS Jammer operating in against various constellations like GPS, GALILIO, GLONASS, BEIDU, IRNSS in L1/B1 and L2/B2 bands. System should be mounted on or inside transport aircraft/ heptr/drone to carry out electronic counter measures mission along with associated ground support and ground handling equipment are required. System should be capable of jamming ground based/ airborne satellite navigation system from the range of 100 - 150 km. System should be self-sufficient for detecting Navigation signals. It should not alter or cause limitation on flight envelope of the aircraft.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
13.	**Development of Low Band Jammer for existing Fighter aircraft**	20 Yrs	90	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Escort Jammers along with associated ground support and ground handling equipment for existing Fighter aircraft in lower band of frequencies (0.5-6 GHz) is required for carrying out active ECM missions. Electronic Jammer is required with appropriate clearances before trials. The pods should be integrated with onboard EW systems. It should not alter or cause limitation on flight envelope of the aircraft.				
14.	**Next Generation Radar Warning Receiver (NG RWR) for Transport Aircraft**	20 Yrs	114	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. NG RWR with open architecture, digital and AI based processing is required for replacement of existing Tarang RWR of transport aircraft. System along with associated ground support and ground handling equipment is required. RWR is required with appropriate clearances before trials. The RWR should be integrated with mission computer for loading, sampling and downloading EW data along with operational data. It should not alter or cause limitation on flight envelope of the aircraft. **Remarks by DRDO – Under development**				
15.	**Programmable Active Radar Signature Counter Measure for Airborne Platforms**	20 Yrs	1,00,000	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Programmable Active Radar signature Counter Measure for Airborne Platforms (Smart CMDS) are packed in small cartridges and fitted in CMDS onboard aircraft. Deployment is through ejection of cartridges using electric pulses. On deployment system actively seeks emitter data and radiates jamming signal. These are required for fighter, transport and helicopters of the IAF. The system should be capable of identifying the hostile emitter frequencies within the environment after deployment/ ejection from aircraft and initiate active ECM to defend the aircraft. The system should be highly cost effective and easily deployable in air as well as the loading and off-loading on ground.				
16.	**Development of Next Gen RWR & ASPJ for Existing Fighter Aircraft**	20 Yrs	200	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. *(a) External EW suite consisting of Next Generation RWR with frequency range from 1-40 GHz and ASPJ (4-40 GHz) is required for operation on advanced fighter aircraft.* *(b) Internal EW suite consisting of Next Generation RWR with frequency range from 1-40 GHz and ASPJ (2-18 GHz) is required for operation on advanced fighter aircraft. Systems are required with appropriate clearances before trials. The systems should be integrated with onboard EW systems. It should not alter or cause limitation on flight envelope of the aircraft.* *(c) Next Generation RWR with open architecture, digital and AI based processing is required for replacement of existing Tarang RWR of existing Fighter aircraft. System along with associated ground support and ground handling equipment is required*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
for protection of aircraft. RWR is required with appropriate clearances before trials. The RWR should be integrated with mission computer for loading, sampling and downloading EW data along with operational data. It should not alter or cause limitation on flight envelope of the aircraft. **Remarks by DRDO – Developed**				
17.	**Drone/UAV Based SIGINT/ELINT**	20 Yrs	100	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Drone/UAV based SIGINT/ELINT system is required to provide SIGINT/ELINT capability in the band of 0.5 to 40 GHz. The system should be able to intercept pre-programmed frequencies with variable parameters as well as in band sweep to detect the ground based as well as airborne radars. System should be cost effective and self-sufficient in terms of power & mobility for operations. Weight of the system to be as less as possible in order to carry it on drone/ UAV.				
18.	**Surveillance, Detection and Tracking System for targets moving at Hypersonic speed**	20-25	10-15	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The system should be capable to detect and track low RCS targets moving at hypersonic speed at high altitude and long range. The system should be deployed either on ground/ airborne/ Space or combination of all three segments. The ground/ airborne/ space based systems should be fully integrated to present comprehensive information about the target. The system should also be capable to fuse the information with Integrated Air Command and Control System (IACCS) of IAF.				
19.	**VHF Radars**	10-15	25-30	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. VHF Surveillance Radars capable of operations upto an altitude of 5000 Mtr AMSL are needed. The ranges must be in excess of 300Km. Radars must have active phased array technology. Ideally the radar must have high update rate and low scan time. It must be capable to detect low RCS/ stealth/SOW class of threats. Also, it must have good ECCM and integrated decoys. It must be low on maintenance. Must have modular design so that upgradability is there. Maintenance requirements must be less. They must be capable of remote data operations. Radars must be quickly redeploy able. Must be Integratable with IACCS.				
AI/ ML/ BIG DATA				
20.	**Multi-Phenomenology Multi-Sensor Algorithm for fusion of data from various sensors**	5-10 Yrs	Lot with unlimited license	DAD, 011-23010231 Ext 7883

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/Preferred Technologies. System capable of providing near-real time actionable information through fusion of data collected from multiple sources, be it OSINT or data obtained from commercial satellites or the internet, or classified data obtained from military sensors (space, air and surface based). Fully integrated with Threat Evaluation through an automated access to the satellite/sensors data in the repository.				
21.	**AI / ML based Change Detection for Multi Payload fused Imagery Data**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. In order to process, treat, analyse and manage large volumes of data available from satellite, there is a need to tap into space tech data using AI, block chain and big data to offer secure data solutions. *(a) Expeditious processing and analysis of imagery data.* *(b) Reduction in launch costs.* *(c) Operational advantages of assessing a target with two different sensors in same time window.* *(d)* ***Avionics, Sensors & Artificial Intelligence (AI)*** *(i) Indigenous FADEC & Mission Computers: HAL's in-house FADEC development should be leveraged for future aircraft and helicopter programs.* *(ii) AI & Adaptive Learning Systems: The roadmap should include AI-driven mission management systems for both manned and unmanned platforms.* *(iii) Quantum Radar & Advanced Sensor Fusion Development of next-gen AESA radars, multi-spectral imaging systems, and quantum sensor technologies.*				
22.	**AI Based Self-Healing Networks**	As per the contract	Lot	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. *(a) Self-healing networks facilitate in monitoring the network in real-time and rectify potential faults before they occur.*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(b) AI-based self-healing networks will help in resolving the network issues without the need of human intervention and can detect and remediate outages, failures and breaches. *(c) Self-healing networks bring in a proactive and predictive approach in network maintenance thus reducing the network downtime.* *(d) With the increasing complexity of network and network elements, the existing monitoring mechanisms will not be able to effectively detect and diagnose malfunctions in real-time. Self-healing networks will facilitate in proactively identifying network degradations and automate the remedial measures in real-time.*				
23.	**Data Fusion Project for Automation of Training Activities**	Lifetime	-	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. An AI/ML based data fusion project for automation of training activities without human intervention is required for automation of following processes:- *(a) Daily classroom attendance (Face recognition+ RFID).* *(b) Daily parade attendance (Face recognition+ RFID).* *(c) Range firing marksmanship score (Sensors and face recognition + RFID).* *(d) PFR score (RFID).* *(e) Endurance score (Face recognition, Posture recognition).* *(f) Gait analysis for posture correction, Face recognition, MEMS (Micro Electro Mechanical Sensors), Treadmill etc.* *(g) Arrival documentation (QR code based biometric identification and authentication on AFNET portal).*				
UNMANNED AERIAL SYSTEMS/ COUNTER SYSTEM				
24.	**Stratospheric Airship**	10 Yrs	20	DAD, 011-23010231 Ext 7883

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/Preferred Technologies. Stratospheric airship capable of communication relay, collect SIGINT data (ELINT data from ELINT-0.03 to 40 GHz and COMINT data from 30 MHz to 6 GHz). The airship should have the capability of being steered between a height-band of 25-35 km and be able to withstand the atmospheric conditions at prescribed levels. Able to withstand effect of westerly Jet streams during winter months and Easterly Jet streams during monsoon. Should have SATCOM and radio relay capability. GCS ranges should be upto 600 km minimum (LoS) and BLoS through Satellite. It should have a programmable flight profile including AI capable usage of avionics and cueing targeting systems using LPI radar/EO/IR/SWIR for buddy mode targeting. There should be an electronic low latency, secure, encrypted Sat link for control in B-LOS and if in LOS distance of 500 km from surface or aerial platforms. It should, preferably have conformal defensive electronic/expendable stores capability.				
25.	**Hybrid RPA**	20	10-20	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The Short Range RPAs with ranges up to 200 km and 20000 ft alt, with capability of rotary wing and fixed wing RPAs facilitating faster transition to and from the target in fixed wing configuration and hover capability in the target area. The ability will also enable to launch and recover the RPA by multiple modes.				
	SATELLITE BASED APPLICATIONS			
26.	**Development of Multiband Programmable RF Sensor Satellite**	5-10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. It is proposed to develop a Multiband Programmable RF Sensor Satellite which is capable of detecting RF sources (0.5-40 GHz) from LEO. Critical parameters that are to be measured from the space-based sensor include intercepted parameters comprising of emitter identification along with time of travel, direction of arrival, frequency range for emitter (minimum and maximum with deviation), all frequency pattern (Fixed, Agile, Batch, Dwell and switch etc.), Pulse Repetition Interval and Pulse Group Repetition Interval (with all PRI pattern like Constant, Jitter, Stagger, Dwell & Switch etc.), PRI associated with each spot frequency Pulse Width, Effective radiated power of emitter along with type of Antenna Scan, Scan Rate, Polarization, Beam width (Elevation and Azimuth), Side Lobe Level (with Standard deviation), Time on Target Wave, Localisation Information (in user defined format) along with Intra Pulse data.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
27.	**Innovative Space Applications for Fourth / Final Stage of Launch Vehicles**	1-2	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. *(a) Last stages of rocket engine after separation of spacecraft will be loitering in the outer space for considerable time. It is understood that during such launches adversary's space based and ground based sensors will be monitoring the launch activities. Thus, it provides an opportunity to map the active RF sources which are monitoring the launch activity.* *(b) Having an ISR payload integrated with the final stages of rocket will help in effectively utilizing its considerable loitering time for detecting and finger printing active RF sources of the adversary. The ISR payload could be either EO/ IR/ELINT or a combination of multiple sensors. These ISR payloads could be looking both upward and downward to detect the sensors which are monitoring the launch activity from space and ground respectively.* *(c) Controlling and extracting the information from the payload will be a crucial activity for which the necessary controlling as well as data extraction mechanism should be in place. Data could be accumulated till the time the payload is available for relaying the information and processed thereafter to extract the requisite intelligence.* *(d) Location of payload, power supply for payload, protection of payload during the ignition of rocket motors are the key challenges which are to be factored in while integration with last stages of rocket.*				
28.	**High Throughput Communication Satellite in LEO With User Terminals**	5 -15	50-70	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. *(a) At present communication satellite services availed through GEO has inherent disadvantages in terms of its known location and latency. Both these factors are disadvantages for conduct of operations. Therefore, there is a need to have an added capability of extending communication services from space with reduced latency.* *(b) LEO constellation is proposed for extending satellite communication services. The payload configuration could be 'Ku' or 'Ka or higher bands of microwave spectrum to accommodate high data rate applications. The payload could be multi-band. Having a dual use communication satellites in lower orbits will be advantageous in terms of security (difficulty in differentiating civil and strategic services),*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
availability (graceful degradation) and high data rate applications. Certain additional aspects which are to be catered and are critical for availing end to end solution are enumerated in following paragraph. *(c) Suitable ground control segment for controlling these communication satellites as well as hub infrastructure should be planned so that an end to end solution is ensured.* *(d) The user segment could be static, airborne and mobile. Airborne user segment could vary in size depending upon the type of aircraft (Fighters, Transport and Helicopter). Antenna radiation pattern of this user segment should possess the dynamic capability to withstand the aircraft rotor blade effects to ensure connectivity with the satellite. User segments could preferably be Software Defined Radio (SDR) sets which are capable to operate at higher data rates (~100 Mbps or better).*				
29.	**On Orbit Maintenance and Refuelling (OOMR) Technology in LEO**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. *(a) Existing satellites be it communication, ISR or PNT will become non-operational once its fuel is exhausted or in case of a malfunction of the component/ sub-system.* *(b) The concept has strategic relevance as a spacecraft or the payload of a satellite could be serviced by a service module for the following purposes:-* *(i) Refuelling the spacecraft thereby enhancing its Technical Life.* *(ii) Service/ replace an unserviceable module.* *(iii) Integrate/ replace an outdated component with an advanced component.* (iv) *Accommodate additional payload which could be used tactically.*				
30.	**On Orbit Propellant Storage and Transfer System**	5-10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. As a component of Sl. No. 26, it is proposed to develop a space based on orbit refueller for LEO satellites. This would necessitate transferring fuel from tanker satellite to the receiving satellite. Given the micro-gravity conditions and the extremities of the environment, space grade fuel storage and fuel-transfer system have to be innovated.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
31.	**On Orbit Space Infra maintenance and upgrade operations**	5-10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. As a component of Sl. No. 26, it is proposed to develop mechanism to perform in-orbit maintenance of space infra and upgrade operations of satellites/payloads. Sometimes, certain payloads may not work as desired, or may reach their end-of-life. As the satellite is still operational, it is cheaper to undertake maintenance activity to replace the payload via another satellite.				
32.	**Modular, Multi-Payload Configurable VLEO Bus**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters:- Modular Payloads. In present satellite bus and payloads are tailor made to meet each other's compatibility specifications. This could lead to problems of interoperability and delays in integration of payload with bus. Hence, integrating payloads and bus in a 'plug and play' concept and decouple the process of manufacturing the payload and bus would be beneficial. *(a) Greater production efficiency for manufactures.* *(b) Greater flexibility in designing and launch of satellite.* *(c) Reduction in timelines in manufacturing and assembling.* *(d) Operational effectiveness for LOD capability i.e rapid response to potential needs.* *(e) Standardisation of buses.* *Challenge Brief:- Multi-payload Satellite. Monolithic missions carry single payload on-board. This results in capturing certain characteristics of target only at the same time resulting in sub-optimal utilisation of the capacity of satellite bus and launch vehicle. Deployment of multiple payloads on a single satellite could help obviate this limitation.* *Advantages:-* *(a) Efficient utilisation of space launches capability.* *(b) Reduction in launch costs.* *(c) Operational advantages of assessing a target with two different sensors in same time window.*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
33.	**Advanced Extremely High Frequency (AEHF) GEO Satellite for Secured Communications**	15	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. AEHF satellites provide a network of encrypted, jam-proof communications for strategic command and control and for tactical missions. The AEHF satellites should handle ten times more data (Approx 44GHz uplink and 20 GHz downlink) and feature advanced encryption technology.				
34.	**L/P band Synthetic Aperture Radar (SAR) Small Satellite**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. X band SAR is highly suitable for detection of manmade objects but fares inferior when dealing with natural concealment aspects like foliage or forest cover. L or P band SAR capabilities with sub-metric resolution for foliage penetration and detection of sub-surface targets could help to discover the targets concealed under. *(a) Foliage penetration.* *(b) Reaction time can be reduced if conjoined with inter-satellite links.*				
35.	**Ultra-light Weight, Sub-Meter Resolution Monolithic SiC Telescope as Optical Payload**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Silicon Carbide (SiC) is the preferred material to develop optical telescopes due to its high stiffens, low coefficient of thermal expansion and high thermal conductivity. As a component of challenge 6, it is proposed to develop a space grade optical telescope using SiC which will offer a sub metric resolution. The optical telescope should be able to integrate as a payload on a small satellite with overall weight of 150 kg.				
36.	**Development of Network Management Port (NMP) for Efficient SATCOM Bandwidth Management Using Multiple Satellites**	15	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. *(a) At present SATCOM resources are permanently allocated to the user. Most of the SATCOM bandwidth are redundant as it is mostly used as standby to main communication link which could be either dedicated or LoS link. Towards effective utilisation of SATCOM bandwidth, a centralized dynamic bandwidth allocation center i.e., Network Management Port could be created wherein the bandwidth is assigned to needy user as per end user segment capability.*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(b) Initially 'C' & 'Ku' could be optimized for centralized allotment. Network Management Port should have the complete control over the bandwidth available from all the satellites. Demand prioritization could be done at space port. *(c) Main issue in establishing a Network Management Port is to the have the commonality factor. The baseband and modulation techniques, protocols and schema will be varying for each user network. Therefore, there is a requirement to convert each of these user equipment standard to a common standard for effective resource allocation through a unified Network Management System (NMS). A common protocol/ standard could be devised by the industry for resource allocation which is independent of user network.* *(d) Network Management Port will be having multiple antennae aligned with different satellites. Further, unified resource allocation will require integration of all these antennae, which may be at distributed locations via a terrestrial connectivity that could be OFC, at the Network Management Port.* *(e) Network Management Port should also possess the capability to monitor the resource available from each satellite. Therefore, monitoring stations are to be installed at Network Management Port through which the unified NMS could understand the details of satellite resources available for utilisation.*				
37.	**Autonomous Docking Operations for OOMR**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Refuelling, maintenance and upgrading operations in orbit requires precise rendezvous, proximity and docking operations. As a component of Sl. No. 26, it is proposed to develop an AI-based system for these critical operations. Using data from the various payloads, the AI should autonomously calculate and complete the proximity operations, as per the mission objectives.				
38.	**Development of On-board Cyber Defence System for Satellites**	5-10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. The existing satellites have limited capabilities to withstand sustained EW or Cyber-attacks. With space being increasingly contested, it is matter of time that space assets become more prone to EW and Cyber-attacks by adversaries in a hostile climate. There is a need to identify vulnerabilities in the current satellites to develop EW and Cyber suites that overcome these vulnerabilities. Such suites will have to be incorporated in future satellites to make them EW and Cyber hardened. Therefore, it is proposed to develop EW and Cyber hardening suites for incorporation in LEO and GEO satellites.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
39.	**Cyber hardening Suite for Satellite Communication links/Hubs**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Cyber hardening Suite for satellite Comn links / Hubs. Aim is to achieve:- *(a) Immunity from RF based attacks like jamming, interception, rouge commanding, spoofing etc.* *(b) Enhanced space craft security.* *(c) Mitigation of adversaries'.*				
40.	**Ultra High Resolution Optical payloads with Edge Computing for VLEO Bus**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Edge computing is a distributed information technology architecture in which client data is processed at the periphery of the network, as close to the originating source as possible. As component of Sl. No. 28, it is proposed to develop an ultra-high resolution optical pay load to be deployed on a VLEO satellite along with Edge Computing based On-board processing system. This on-board edge computing tool should be able to process huge data received from UHR payload of VLEO satellite.				
41.	**HySIS Payloads for VLEO Bus**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Hyper Spectral Imaging Spectrometer (HySIS) payload is proposed to be developed for satellites to be launched in the Very Low Earth Orbit (VLEO). The challenge also includes real-time processing of data and storage of the data generated. This payload may be miniaturized for deployment on small satellites.				
42.	**Intelligent On-board System for satellite mission planning.**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. It is proposed to develop an Intelligent On-board System for Mission Planning of Satellites with RF sensors. This intelligent on-board system should be able to execute missions autonomously based on inputs from ground control and collect critical RF data in an efficient manner for successful detection of various RF sources.				
43.	**Ground controlled Satellite Antenna Frequency Switching Sys**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. It is proposed to develop a Space based, Multi-band Antenna system for RF sensor satellites that can operate in different frequency bands, eliminating the need for separate antennae for different frequency bands. It should be configurable by a ground based control system for switching and tuning the on-board antenna for various frequency bands.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
44.	**Multiband RF Sensor Data Processing and Analysis Solution**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. It is proposed to develop a Data Processing and Analysis tool for multiband RF data collected by RF sensor satellites. This multiband RF data is to be processed by a ground-based processing platform and analysed using AI tools.				
45.	**Miniaturized Multi-Payload Satellite (EO, IR, SAR, Hyper Spectral) up to 150 Kgs**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Payload miniaturization is the current requirement as it ensures less complex designs and less maintenance efforts. Heavier payloads demand more power and thermal control mechanisms. Also, miniaturization of payloads would ensure launching more satellites in same lift off event. Advantages:- *(a) Payload reduction in terms of weight penalty and form factor.* *(b) Launch of multiple satellites in same mission.* *(c) Expeditious deployment of constellations.*				
46.	**L/P band Continuous Wave SAR payload for LEO Small satellites**	5-10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. It is proposed to build an L/P band Continuous Wave SAR payload for small satellites to be deployed in the LEO. The SAR payload would be integrated into the small satellite developed for this purpose.				
47.	**Unfurlable, Electronically steering Antennae for L/P band SAR Payload**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Origami technology is a promising field to innovate various antenna design. Origami techniques offer many interesting characteristics, including self-foldability, programmable curvature and programmable collapse. Origami technology offers very efficient and low-cost alternatives, enabling flexible and deployable antennas that were previously impossible with conventional antenna fabrication processes. Therefore, Origami based Unfurlable and Electronically Steered L/P band SAR antenna for a small satellite in LEO is proposed to be developed.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
48.	**Miniaturization of Payloads (EO and SAR) for a small satellite up to 150 kg**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. With the advancement in electronics, many payloads earlier deployed on dedicated large satellites are now being miniaturized. These payloads can be easily integrated into a small satellite with an overall weight of 150 kg. An advantage of such small satellites is the ease of manufacture, low cost and ease of launch. It is proposed to design and develop a modular type small satellite, which should be able to integrate these miniaturized payload Electro-Optical, Infrared, Synthetic Aperture Radar and Hyper Spectral sensor.				
49.	**Miniaturization of Payloads (IR & Hyper Spectral) for a small satellite up to 150 kg**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. It is proposed to develop miniaturized Infra-Red sensor and Hyper Spectral sensor to be integrated on a miniaturized small satellite as a single package. The developed sensors package should be able to integrate easily into a small satellite with overall weight less than 150 kg and provide complete imagery data for on-board processing.				
50.	**Miniaturization of On-board Antenna sys using Additive Manufacturing Techniques**	5 – 10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. Additive Manufacturing (AM) uses computer-aided-design (CAD) software or 3D object scanners to direct hardware to deposit material, layer upon layer, in precise geometric shapes. It is proposed to develop miniaturized on-board antennas for Payload data download and TM/TC communication which are to be deployed on small satellites. The AM technology is to be utilized to for fabricating the miniaturized antennas for small satellites.				
51.	**High-speed On-board Data Processing Technology for LEO Imaging Satellites**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. The present satellite dump imagery data to a ground station where basic Level image processing is carried. This leads to latency in processing. On-board processing reduces the time for dissemination of imagery data and enables taking intelligent imaging decisions on board. Advantages:- *(a) Improved Turn Around Time (TAT) for delivery of images.* *(b) Intelligent imaging decisions on-board.* *(c) More info can be accrued from the same imaging opportunity.*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
52.	**Motion Controller (Hardware and Software) for LEO Antenna Stations**	5 -10	2-5	DAD, 011-23010231 Ext 7883
Broad Parameters. The present satellite ground stations for LEO satellites require a motion controller module which tracks the movement of satellites during the visibility. These motion controllers have both software and hardware components. It is proposed to develop an antenna motion controller for LEO satellite antenna stations. The motion controller should be able to steer the antenna up-to velocities of 16 degrees/sec or more. The building blocks like axis control cards, safety logic cards, Processor cards, high power relays (3 ph, 440 volts) of this motion controller to be indigenous. The software should be able to accept the two-line element set (TLE) format and related file formats with IRNSS timing signal to steer the antenna for given velocity. Remote operation of the antenna motion controller through an IP network should be possible.				
METEOROLOGY				
53.	**X-Band Mobile Doppler Weather Radar (DWR)**	15	5-10	DAD, 011-23010231 Ext 7883
Broad Parameters / Preferred Technologies. DWRs are capable of detecting and estimating Meteorological parameters. DWR is specially suited to monitor thunderstorms which are associated with weather hazards like rain / severe turbulence / strong winds / lightning / low level wind shear / icing that are critical for aviation. It can provide information about severity, distance, vertical extent, direction of movement and aerial extent of Cumulonimbus clouds which are essential for timely issue of advisories, both during day & night. An X-Band DWR has limited range but smaller in size and easier to operate. The minimum detection range should be more than 100kms with dual polarisation. Mobility would fill gaps in existing DWR coverage and provide further flexibility for operations in a military environment.				
54.	**Digital Electronic Theodolite (DET)**	5-7	50-75	DAD, 011-23010231 Ext 7883
Broad Parameters / Preferred Technologies. DET is used for tracking gas filled Pilot Balloons for measuring upper air winds. These wind observations play a very significant role not only in weather now casting / forecasting but also in flying operations particularly during take-off and landing phase. DET has capability to store data of azimuth & elevation reading. DET can track a gas filled balloon up to an average height of 12.0 km.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
		WEAPONS/ DEW		
55.	**EOIRST on Fighter Aircraft**	15	>70	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The system should be able to carry out passive search, detection and tracking of air and surface targets with day and night capability using its thermal imagers, CCD cameras and Laser Range Finders even under conditions of zero visibility. It should provide detection of small surface targets in search mode at greater than 20 km. **Remarks by DRDO – Under development**				
56.	**Small Diameter Bomb (SDB) for HALE/MALE/UCAV**	10-15	300-500	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. The SDB must have modular warhead of 10 to 15 kg total wt, warhead of between 01 to 02 kg (scalable upto 100 to 120 Kg for UCAV) with a length between 1.5 to 2.0m that can engage Class 'A' vehicles (Rolled homogenous armour penetration of upto 900 mm), radars, soft skinned targets, troops, bunkers, ammunition dump, Gun positions, logistics and communication nodes. The warhead type may be Multipurpose Tandem, Thermo baric and Sub-munitions with variable fuse delay of upto 7 days. Range of 12 km (ballistic drop) and upto 20km (with REK).Accuracy to be of the order of Static targets < 0.5m Mobile targets < 1m.INGPS terminal accuracy < 10m with either laser, IR or INGPS with SAASM chip capabilities.				
57.	**NLOS Guided Ammunition**	10	250	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. NLOS guided ammunition should allow helicopter to engage targets with a high degree of precision, even in complex and challenging environments. It should enable the helicopter crew to guide the ammunition to a specific point on the ground, minimizing collateral damage and reducing the risk of friendly fire incidents. It should enable helicopters to engage targets from a greater standoff range, reducing the risk of exposure to enemy fire. It should be effective against a wide range of targets, including armoured vehicles, buildings and fortification. The missile guidance system should be capable of providing with real time video and man-in-loop control through missile's flight giving the opportunity to alter or abort the mission while enroute to the target. It should cost be effective as well as lightweight weapon that can be employed by light helicopters. It should have a range between 50-60 kilometres, effective against armour as well as softer targets.				
58.	**Precision Long Range Attack Cruise Missile**	10-15	200-250	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The air launched cruise missile should have a minimum range of 250 km. Missile to be equipped with a min 50 kg explosive warhead and can be modified to carry other payloads, such as infrared target seeking and guidance devices. Missile to be is guided by GPS and with the ability to loiter over the target area, before confirming the target through real-time visual intelligence. Missile to be fitted with a variety of warheads which can be targeted on both land and sea targets with ability to loiter,				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
to target well-hidden threats in addition to moving targets. Needs to have on-board autopilot and inertial navigation/global positioning navigation systems (INS/GPS) allowing the missile to perform its mission autonomously. A data link to enable intervention and target validation. **Remarks by DRDO – Under development**				
59.	**Air to Surface Missile for Fighter And Bombers**	10-15	200-250	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The air to surface missile with a range of 75-100 km should be capable of being fitted onto tactical fighter class aircraft and bombers. It should have an Inertial Navigation System (INS) for midcourse guidance and a TV or IIR sensor for terminal guidance. The missile's terminal guidance need to be exclusively man-in-the-loop; footage from the missile's seeker to be transmitted via data-link to an operator in the host aircraft that remotely guides the missile to its target with an expected circular error probable (CEP) of 3 meters. **Remarks by DRDO – Under development**				
60.	**Smart Loitering for BVLOS Munitions**	10-15	200-250	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. Ground launched loitering electro-optically guided munitions with a range of 500-1000 km. The munitions should be capable for carrying 50Kg of explosive warhead and ability to loiter for more than 6 hr. It should include full mission capabilities, from search, attack and battle damage assessment without relying on other external systems for targeting and mission intelligence. The munitions should have the capability to be programmed before launch to autonomously fly to a predefined "Holding Area", where they loiter. The operator directs the selected munition to the target area and uses the video image to select a target, and to attack it. It then tracks the target and then dives on it, detonating the warhead upon impact.				
61.	**Universal Launcher for Aircraft**	10-15	Lot	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. Presently, OEM supplied launchers/adapters are used for fitment of weapons/stores onto the fighters and helicopters. These launchers/adaptors are restricted due to weight carrying capacity of the launcher and are different for each type of weapon/stores. Frequent change of launchers is required based on mission requirements and this leads to delays in availability of aircraft for operations. There is a need to develop a common launcher capable of carrying various air to ground (A-G) store and air to air (A-A) missiles. The launcher can later be upgraded to carry stores like reconnaissance and flight refuelling pods. Few broad operational requirements are as follows:- *(a) The Common launcher should be adaptable to most of the Western and Russian weapons.* *(b) Should be capable of carrying both long and short range A-A missiles.* *(c) Should be capable of carrying A-G missiles and guided bombs.*				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(d) Should require minimum changes for role change of aircraft. *(e) Ease of Sustenance and maintenance of the eqpt.*				
MISCELLANEOUS				
62.	**ADAS (Advanced Driver Assistant System) for Heavy Vehicles**	10	1200	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. *(a) Should combine both active and passive features to mitigate risk associated with driving by minimizing influence of human error. The employed technology should be Autonomous in nature and should maintain secrecy of operation. The following technologies are sought to be implemented on vehicles of weapon system:-* *(b) Embedded Vision System (EVS). Optical/RADAR/LIDAR System to provide crucial input of high level warning function. It should have AI enabled to reorganize traffic signs, hazard indications and other traffic notifications.* *(c) Adaptive Cruise. Should be able to sense condition of road and terrain to maintain consent speed for operational deployments with minimum human intervention to enable swift deployment like in case of SAGW systems.* *(d) Intranet Wireless Connectivity. To provide short range secure high speed data connectivity between elements of convoy during move. This will enable reliable and secure transfer of sensitive data during move.* *(e) Advanced System Architecture for ADAS. An advanced automated AI based architecture to provide an interface between Vehicle Control System, EVS, Other Sensors, Communication Network and Human Machine Interface (HMI).* *(f) HMI. A Simple and easy to use HMI design for drivers to interact with ADAS.*				
63.	**Power System & UPS**	15	85-100	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. Modern Power Generation solutions like portable DMFC (Direct methanol fuel cell) or HFC (Hydrogen fuel cell) or any other modern technology capable of supporting Radar Power requirements (i.e. upto 250 KVA). The Power solution to have UPS capable of operating at least for 30 minutes. The Power & UPS must be able to operate upto 5000 AMS.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
64.	**Ground incursion avoidance system and display**	20	3000	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The equipment relates to an aircraft on ground, particularly to a system and method for displaying a zone of protection associated with an aircraft while manoeuvring on ground. The indigenous system should be designed in such a way so as to retrofit the present fleet with minimal modifications.				
65.	**Rescue Harnesses & Winch Basket Cradle Stretchers, Arctic Tent for CASEVAC and SAR**	10	800	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. IAF actively undertake SAR and CASEVAC operations which necessitate winching up a casualty from places unfit for landing or rescuing troops from inhospitable and confined areas. Rescue Harnesses for both the Rescuer and the Survivor are a necessity that would guarantee safe and expeditious recovery in event of a SAR/ CASEVAC. Similarly, in case of a lying casualty, there is a requirement of Winch Basket Cradle Stretchers with Anti Rotation Device. These equipment should have a Durable design with a long Shelf Life and capability to operate over wide range of environmental conditions with Load capability of minimum 150 Kgs. The stretcher should be preferably MRI and X-Ray compatible. Arctic Tents which provide shelter against extreme temperatures are carried on-board aircraft for use in the event of a Survival situation during High altitude operations. The Arctic Tents should be insulated, lightweight ,rugged, durable and easy to install and stow in extreme weather while providing protection to Survivors in temperatures below – 50 deg C.				
66.	**Large Area Aerial Liquid Dispersion (LAALDE)**	10	100	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. With changing weather conditions, the chances of forest fires have increased manifold. Similarly, the chances of large scale fires in urban areas or vital installations are very high which can lead to loss of valuable equipment and resources. Helicopters have the capability to undertake aerial firefighting on large scale and IAF Mi-17 V5 helicopters have successfully demonstrated capability to undertake Aerial Fire Fighting ops with HL-5000 Bambi Buckets. All helicopters need to be equipped with similar capability for HADR ops which can be provided with Large Area Aerial Liquid Dispersion (LAALDE) systems. Systems of varying capacities as per the capability of helicopter along with robust release mechanism from the helicopter are required.				
67.	**Fuel Bags for Forward Helipads**	On condition/10 Years		DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. Portable aviation fuel bags are mobile fuel tanks that can be utilised at Forward Area Helipads or High Altitude helipads where fuel cannot be moved through other means and provide limited storage. The capacity of the fuel bag should be sufficient to meet the fuel storage needs of the aircraft of application, while remaining within the weight and space constraints of the aircraft. The fuel bag should be equipped with necessary fittings, such as valves, hoses, and connectors, to allow for safe and efficient fuel transfer to and from the bag. The fittings should be compatible with standard refuelling equipment used in the				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
aviation industry. The fuel bag should be made from high-quality materials that are resistant to abrasion, puncture, and fuel contamination. The bag should also be designed to withstand the environmental conditions of the storage and transportation location, such as temperature, wind and precipitation. It should have a fire-resistant material. Its capacity should be minimum 5,000 Ltrs. It should withstand temperature from -30°C to 50°C and winds up to 80 Km/h (50 mph). It should meet the requirements of the Civil Aviation Authority (CAA) for portable fuel tanks.				
68.	**Advanced materials for Aerospace Structures**	10-15	Lot	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Development of advanced materials like Graphene/ carbon nanotubes for aerospace structural applications replacing Al and Ti. Materials which can be used to manufacture the de-icing systems that are inserted into the wings of the aircraft. The materials should have the potential for wide range of aerospace applications such as:- *(a) Self-sealing property makes it valuable as coating materials for wings, strengthening the weak points of helicopter and aircraft structures.* *(b) Thinnest and strongest materials that conduct heat better than all other materials and is an excellent conductor of electricity and has the most invisibility because of its transparency.* *(c) Incorporation of nanotubes in shape memory or self-healing allows for the creation of versatile structures that are multifunctional in nature and sustainable for long duration.* *(d) Resistant than steel and five times lighter than aluminium, both highly desirable properties in an aircraft. The tensile strength of graphene is over 500 times greater than that of titanium.*				
69.	**Combat Vest**	10	10000	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. A tactical vest that can be worn over regular clothing for carriage of supplies during mission. The vest must have a breathable design that doesn't interfere with operations and enhances the capability by providing protection and carriage options for items like – survival equipment, radio, weapons, magazines, flying kits, IFF systems, battle stores. It must be expendable with attachments and provision for adding mission based pouches / kits. The complete vest should have capability to add ballistic protection based on mission and users. The adjustable straps / any other technology must provide fitting to individual body size.Combat vest for aircrew, ground crew and troops.				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
70.	**Seat Survival Pack**	5	1000	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. A composite survival pack that can be carried in a fighter aircraft ejection seat. The survival pack to be made after studying design of ejection seat. Must be compatible with different type of seats with/ without use of adapters. The contents of survival pack must ensure survival of downed crew for 7 days. The survival pack to have elements for survival in mountains, desert, sea and jungle. Survival pack for aircrew .				
71.	**Shaped Array Antenna**	40	100	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies. Develop technology for preparation of conformal antenna for fighter aircraft. The antenna to be flush mounted with aircraft structure. Technology for development of antenna for different bands – V/UHF, L, S C, X and any other band in future. The antenna to be capable of beam steering to provide LPI communication with other aircraft and ground station. The technology to have compatible technology for beam steering, other aircraft identification and beam steering. Conformal antenna should be able to replace present whip/ blade antenna without performance degradation. Conformal antenna for aircraft.				
72.	**On Demand Spares Through Additive Manufacturing**	5	1000	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies Technology to rapidly prepare spare parts / on demand spare parts for mechanical nature for aircraft. The system must be capable of manufacturing parts from data base and actual parts. The material for manufacturing must be capable of certification of end products and carry a CEMILAC certification for end equipment. A technology to prepare spare parts through additive / similar manufacturing.				
73.	**Ejection Seat for Fighter Aircraft**	40	200	DAD, 011-23010231 Ext 7883
Broad Parameters/Preferred Technologies Ejection seat for fighter aircraft for enabling safe ejection and recovery from fighter aircraft at zero speed, on ground to max speed of fighter at high altitude. The seat must be capable of fitting in different class of fighters with / without modification, must have capability as available in present day ejection seats. It must enable ejection in any orientation from aircraft, at any altitude and any speed. Complete ejection seat for fighter aircraft.				
74.	**Flight Test Instrumentation System**	10-15	50	DAD, 011-23010231 Ext 7883
Broad Parameters/ Preferred Technologies. The project is to design and develop Flight Test Instrumentation (FTI) system for prototype aircraft and in-service aircraft. The Flight Test Instrumentation system must be Mil Grade certified with all necessary certifications and qualifications pertaining to airborne requirements as specified by CEMILAC. The FTI must be capable of recording analog, digital data bus (ARINC, 1553, RS-232 or any other communication protocol of aircraft) and discrete. The software must be				

Sl No	Programme/Project	Expected life of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
intuitive for programming the Data Acquisition resolution and sampling rates. The system must be able to handshake with on-board telemetry systems.				
75.	**Aerospace & Aircraft Technologies.**			
Broad Parameters/ Preferred Technologies. *Increased electrification of aircraft systems to be a major focus.*				
76.	**Helicopter & Rotorcraft Systems.**			
Broad Parameters/ Preferred Technologies. *(a) Advanced Rotorcraft Technology.* *(b) Hybrid Propulsion Systems: Need for a roadmap on hybrid / electric propulsion for helicopters and UAVs.*				

TPCR 2025

JOINT ENTRIES : TRI SERVICES (ARMY, NAVY & AIR FORCE)

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
REMOTELY PILOTED AIRCRAFT AND SYSTEMS				
1.	**Medium Altitude Long Endurance (MALE) RPA**	15 - 20	IA- More than 120 IN- More than 120 IAF- More than 120	IA: 011-23018861 IN: 011-23011711 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. The RPA and its payloads should be capable of undertaking the task of search and reconnaissance of area as well as moving target, Artillery Adjustment, Urban Security, Combat SAR, Coastal and Maritime Patrol, Disaster Control and Protection of Facilities. Altitude ceiling should be around 30000 feet or above. Endurance should be more than 24 hrs with SAR and EO/IR payloads. The maximum range should be more than 250 Km in LOS mode and max possible with SATCOM link. Detachable Payloads to include Maritime Radar, ESM, ELINT, ECCM, COMINT, EO/IR, SATCOM Link. VTOL Shipborne for marine version. **Remarks by DRDO – Under Development**				
2.	**High Altitude Psuedo Satellites (HAPS)**	10	IN-15 IA-45 to 50 IAF-25	IN: 011-23011711 IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
*Broad Parameters/ Prefered Technologies by **IN & IA**. Unmanned airships or airplanes positioned as pseudo satellites above 18-22 km in the stratosphere and able to emulate satellite performance at local scale. HAPS is planned to be a solar powered autonomous unmanned aircraft, on which modular payloads can be fitted. Endurance of 90 days for ISR over farthest reaches of IOR is being*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
targeted. Payload capacity – 35 Kgs. Payload to include Medium Wave Infrared (MWIR) Camera, Synthetic Aperture Radar and ELINT systems. *Broad Parameters/Preferred Technologies by **IAF**. High Altitude Pseudo Satellite system (based on stratospheric UAV), powered by Solar energy capable of communication relay, collect SIGINT data (ELINT data from ELINT-0.03 to 40 GHz and COMINT data from 30 MHz to 6 GHz). Should have endurance of at least two months & capable of high altitude loiter exceeding 60,000 ft. It should have a programmable flight profile including AI capable usage of avionics and cueing targeting systems using LPI radar/EO/IR/SWIR for buddy mode targeting. There should be an electronic low latency, secure, encrypted Sat link for control in B-LOS and if in LOS distance of 500 km from surface or aerial platforms. It should, preferably have conformal defensive electronic/expendable stores capability.*				
3.	**Remotely Piloted Aircraft (HALE, VTOL, Ship-borne)**	For IA - 20	IA-20 – 30	IA: 011-23018861 IN: 011-23011711
		For *IN* - 15	*IN* HALE – More than 20 VTOL – 25 - 30 Ship Borne – More than 50 Systems (Each system having 03 RPAs by Navy	
Broad Parameters/ Preferred Technologies. Detachable Payloads to include Maritime Radar, SAR, ESM, COMINT, EO/IR, SATCOM Link. The RPA should be able to operate up to 40,000 feeet above MSL with more than 25 hours endurance and MTOW < 8,500 Kg. capabilities of Auto Take Off & Landing and Communication link based on LOS and SATCOM.				
4.	**Upgrade of Existing MALE RPA**	20	20-30	IA: 011-23018861
Broad Parameters/ Preferred Technologies. SATCOM capability, enhanced endurance, upgraded engine.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
5.	**Combat RPA**	20	IA-More than 30	IA: 011-23018861 IN: 011-23011711
			IN-More than 30	IA: 011-23018861 IN: 011-23011711
Broad Parameters/ Preferred Technologies. MALE class of RPA with capability to fly up to 30,000 ft alt with extended ranges (SATCOM) and endurance more than 24 hours. Capability of engagement of static and mobile ground targets and Maritime Targets (Surface and Underwater) with a min stand-off distance of 20 km.				
WEAPONS AND SYSTEMS				
6.	**Anti RPA Defence System (RF Inhibition)**	10 Yrs	More than 90	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. It should be designed to disrupt and neutralize RPAs engaged in hostile airborne surveillance or any other activities. It should have combination of electronic scanning radar target detection, electro-optical (EO) tracking/ classification and directional RF inhibition capability. Sys should be able to remotely detect all RPAs from micro to MALE. It should be operated in mil as well other RF Bands. Detection range ≥ 40 Kms (IAF), ≥ 20 Kms (IA), EOTS range ≥ 12 Kms (IAF) ≥ 08 Kms (IA)and RF inhibition range ≥ 7 Kms (IAF), ≥ 05 Kms (IA). **Remarks by DRDO – Under Development**				
7.	**Tactical High Energy Laser System**	IA-12	IA Ph 1 Less than 05 Ph 2 More than 10	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
		IAF: 10-15	IAF Based on VA/VPs of all three services and Civilian centres.	Remarks by IAF Ph 1-Range < 6-8 km Ph 2-Range >15km (IAF)

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
*Broad Parameters/ Preferred Technologies by **IA**.* *Phase I* *(a) A Vehicle based LASER weapon system to cause physical damage/destruction to UAS.* *(b) Weapon system should be capable of an effective range of more than 5 km.* *(c) The system should be of small size, light weight, compact and miniaturized mounted on an HMV vehicle.* *Phase II* *(a) Range should be upto 10 km and beyond.* *(b) Should have gyrostabilised aiming and target locking capability.* *Broad Parameters/ Preferred Technologies by **IAF**.* *Phase I* *A HMV based LASER weapon system to cause physical degradation/damage/destruction to EW systems, communication systems and non-communication systems/radars and their antennas.* *Should be also effective against microwave towers, cellular towers, and cables.* *Weapon system should be capable of an effective range of 6-8km.* **Remarks by DRDO – Under Development**				
Should be capable against small aerial targets/ objects. *Phase II* *Should be effective against Soft skinned vehicles and troops.* *Range should be upto 20 KM and beyond.* *Should be capable of anti-satellite role from ground & aerial platform.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Should be as effective in ground-to-ground role as for ground-to-air role. *Additional Requirement* *Should be able to simultaneous tackle multiple threats.* *Should have inbuilt power source.* *Should have gyro stabilized aiming and target locking capability.*				
8.	**High Power Electromagnetic Weapon System**	10	IA Ph 1 Less than 05 Ph 2 More than 05	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
			IAF Based on VA/VPs of all three services and Civilian centres.	Remarks by IAF Phase 1: Range less than 5 Phase 2: Range more than 15
Broad Parameters/ Preferred Technologies BY IA. *Phase-I. High Energy Electromagnetic Weapon System to be employed against enemy's electronic & electrical system in TBA at a range of 6-8 KM and more. Should be effective against all cellular towers, microwave towers, communication networks and command & control setup. Should be effective against avionics & radars of aircrafts, UAS & RPAs.* *Phase-II. Should be effective against vehicle ignition system, IEDs, mines and guidance system of missiles, PGMs and SSMs. Range should be more than 10 km.* *Broad Parameters/ Preferred Technologies by IAF.* *An HMV based High Energy Electromagnetic Weapon System, to be employed against enemy's electronic & electrical system in TBA at a range > 15 KM and more.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Should be effective against all cellular towers, microwave towers, communication networks and command & control setup *Should be effective against avionics & radars of aircrafts & RPAs.* *Additional Requirements.* *Should be able to effectively radiate a peak power of 30-50KW to physically destroy large projectiles and weapons like cruise missile, drones, ballistic weapons and may be employed in Anti Satellite Role.* *Should be effective against airborne and space based aerial threats.* **Remarks by DRDO – Under Development**				
Marine Systems				
9.	**Targeting Pods**	15	More than 100	IN: 011-23011668 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. Targeting pods for fighters and payloads for RPAs. These pods should consist of the day and night sensors including Laser designator for detection and tracking and surface targets and to provide targeting data for laser/ EO guided bombs. The system is to be based on state of art IR and CCD sensors with good detection ranges and would need to be integrated on the IN fighter and RPAs. The pods should have laser Spot Seeker with search and tracking facility, Laser Marking (LM) facility and Night navigation capability by display of FLIR imagery on HUD for fighters.				
10.	**SATCOM Systems**	15-20 Years	IN-100 IA – 450 to 500	IN: 011-23011668 IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ preferred Technologies. Existing SATCOM systems are a mix of COTS and Mil grade equipment, wherein several components/ modules are of import nature. Accordingly, it is proposed to undertaken development of an indigenous Rukmani system with advanced features viz. phased array beam steering technology				
WEAPONS/DEW				
11.	**Air-to-Surface Missile for HALE / MALE / UCAV**	10-15	IAF-200-300 IA > 80	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/Preferred Technologies. The Missile should be of 10 to 15 kg total wt, warhead of between 01 to 02 kg with a length between 1.5 to 2.0m that can engage Class 'A' vehicles (Rolled homogenous armour penetration of upto 700 mm), radars, soft skinned targets, troops, bunkers, ammunition dump, Gun positions, logistics and communication nodes. The warhead type may be Multipurpose Tandem and Kinetic hard nose penetrator/slicer. Range of 12 km (ballistic drop) and upto 20km (with REK).Accuracy to be of the order of Static targets < 0.5m Mobile targets < 1m.INGPS terminal accuracy < 10m with either laser, IR or INGPS with SAASM chip capabilities. Should have capability to engage Static and mobile targets in dual seeker mode. The missile should have Day + Night capability. Programmable approach and impact angles by the operator (30 deg for shallow hit angle & 60 deg or more for steep hit angle).				
12.	**Technical Area Entry/Exit & Personal Presence Monitoring System**	IAF-30 IA-10 to 15	IAF-300 IA>25	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/Preferred Technologies. A system based on RF, facial recognition, AI/ML based profiling, event generation and warning generation. This will include development of the following:-				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(a) Identity card. A novel identity card based on RF, contact, copy proof, digital biometrics and remote ID capable card to enable accurate ID of all individual at entry, exit and locations within camp. Facial recognition based identification, behaviour based pattern identification. Complete camp data processing within technical area. *(b) Vehicle cards. Card to identify vehicles, number plate correlation with ID card and tracking within camp area.* (c) *Complete profiling of all entrants in technical area and their data logging.* *A system to enable entry, movement and exit of all individuals and vehicles in technical area.*				
13.	**Fireproof Breathable Cloth/ Yarn for Overall / Flying/ Ground clothing**	IAF-2	IAF-3000/yr	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
		IA-5	IA > 1000/yr	
Broad Parameters/Preferred Technologies. A fireproof cloth / yarn that is washable, breathable and lightweight. The cloth / yarn to be used for making clothing items for aircrew, ground crew and troops. The cloth/ yarn should not change properties when exposed to -40° C to +60° C, high humidity, high altitude and sea salt spray (For making overall for aircrew).				
AMMUNITION				
14.	**70 mm Air to Ground Rockets**	10	HE, Flechelette, Multi Dart, Inert Prac, All large Qtys	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. Air-to-Ground unguided rockets capable of being fired from existing rocket pods. Options for arming a common motor with warheads like High Explosive (HE), Armour Piercing (AP), Smoke, sub-munitions. Direct and indirect mode over ranges varying from minimum 4 to 8 Kms Suitable redundant safety mechanisms/ design features to obviate				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
activation on mishandling/ ejection. Chemical composition should be stable/ inert across varied temperature/ altitudes. Types of warhead to be used are High Explosive (HE), Armour Piercing (AP, AP-T) & practice (Smoke & Flash). This should be transportable by Road, Rail, Air and Ship.				
15.	**20 mm Gun Ammunition**	30	HE, Flechette, Multi Dart, Inert Practice (All large numbers)	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. *(a) 20mm calibre belted gun amnmunition capable of being fired from existing 20mm Gun fitted on helicopters in flight (moving or stationary)* *(b) Capable of operation in the complete flight envelope of the platform in Indian conditions.* *(c) Ball, Tracer, Armour Piercing variants should be capable of being fired in mixed sequence without causing blinding flash, excessive smoke or fouling, damage to gun or helicopter. The cartridges should be housed in water proofed casing with non-corrosive and non-mercuric primer and be light weight to impose minimum weight penalty.* *(d) Capable of being stored/ maintained in field conditions without resorting to special storage conditions.* *(e) Safe transportation by road, rail or air with shelf life not less than 10 yrs.*				
16.	**5.56 mm ammunition for Assault Rifle**	-	Large numbers	Joint As projected by Navy
Broad Parameters/ Preferred Technologies. 5.56x45 mm ammunition is presently being used for INSAS Rif and LMG. INSAS family will be phased out on induction of AK 203 (7.62x39 mm). 5.56x45 mm ammunition would be utilised for CQB Carbines being inducted for tri-services. Since, indigenous capability exists to manufacture 5.56 mm ammunition no criticality or shortage is envisaged.				
SENSORS				
17.	**Next Generation Night Vision Devices (IR/Thermal Imaging)**	10	Large Numbers	IAF: 011-23010231 (Ext 7883) IN: 011-26771553

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Board Parameters/Preferred Technologies. The device should be handheld and provide, even in zero visibility conditions, day and night detection and recognition capability against small surface crafts, aircraft and personnel.				
Radars				
18.	**Bird Monitoring & Detection Radar (BMDR)**	15-20	IN-Limited numbers IA>25	IAF: 011-23010231 (Ext 7883) IN: 011-26771553
Broad Parameters/ Preferred Technologies. Static, Mobile or Portable. (Field deployable). The cabin/shelter/Equipment should be towable (using commonly available vehicle like tractor). Radar should be deployable at all altitudes in India, presently the highest airfield is Leh with an elevation of 10682 feet. Maximum duration on station (for non-stop operations). Should withstand weather conditions encountered across India. Ease of deployment (ease of operating jacks, standard levelling procedures etc.)				
Sonars and Sonobuoys				
19.	**Helmet Mounted NVBs**	15	Large Numbers	IAF: 011-23010231 (Ext 7883) IN: POC- Cmde (SR) 011-26771553
Broad Parameters/ Preferred Technologies. The equipment should be less than 1 kg, snug fit, water and weatherproof. It should be capable of being fitted on existing helmets. It should be capable of detecting and identification in pitch dark conditions.				
20.	**Development of Mobile Ground station operating S/X/Ka bands**	-	01	
Broad Parameters/ Preferred Technologies. This would equip seamless downloads of satellite data and uplink of necessary information to satellite from a place of choice as per operational requirements.				
CBRN AND FIREFIGHTING				
21.	**Ground Based System/ Ship Installed Radiac System (SIRS)**	15	IN- 35 – 40 IA-20	IN: 011-23793514 IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Technologies. To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available. Proposed system should not be limited to Ships only, but also be developed as a universal design for integration with ground-based system.				
22.	**Ship Installed Chemical Agent Detection System (SICADS)**	15	IN- 35 – 40 IA- 20	IN: 011-23793514 IA: 011-23018861
Broad Parameters/ Technologies. Based on latest Ion Mobility Spectrometry (IMS) based technology. To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available. Proposed system should not be limited to Ships only, but also be developed as a universal design for integration with ground-based system. **Remarks by DRDO – Developed**				
EW AND COMMUNICATIONS				
23.	**IFF Mk XII (S)**	20	IN-More than 1200 IA-1200	IA: 011-23018861 IN: 011-23015216
Broad Parameters/ Preferred Technologies. IFF Mk XII(S) is an equipment for identification of friend & foe ac, to be employed by all three services. The equipment should have ground/ surface based interrogators & transponders. The weight & dimension of equipment should be commensurate with the limitations of the platform. The equipment should be fully compliant to STANAG 4193 & ICAO Annexure 10. System should have Built-In Test (BIT) functions. The equipment should have long/med/short range interrogator facility. The transponders should be capable of identify itself to various integrating platforms. **Remarks by DRDO – Developed**				
24.	**High Altitude ELINT Sensors With SATCOM Link**	15-20 Yrs	50-100	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad parameter/Preferred Technologies. *The required parameters are as follows:-* *(a) The ELINT sensors and its associated equipment should be capable of undertaking the task of intercepting low, medium and high band emitters.* *(b) Operational altitude ceiling should be above 15000 feet AMSL for the sensors and supporting equipment including the DG system & mounted vehicles.* *(c) The minimum range of sensors should be more than 500 Km and should be able to operate at temperature below - 400C and maximum of + 600C.* *(d) Sensor should be capable of record the intercepted track automatically without human intervention for analysis at later stage.* *(e) Sensor should show all recording till the time it is marked as analysed.* *(f) Sensor should have minimum frequency resolution.* *(g) Sensor should differentiate between EM reflections and actual target .* *(h) Sensor should have the provision of alarm to differentiate different types of targets along with finger printing (intra-pulse) analysis.*				
25.	**Hand Held Sat Phone Mobile**	10-15	Medium numbers	IN: 011-23015216 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. *Dimensions (Length, Width, and height) of the hand held SAT Phone. Lightweight set including battery. High visibility colour screen. Provision available on handset for connecting with USB port, audio socket, antenna port etc. Water and dust proofing standard/rating. Voice service. Call ID, Call waiting, Call divert, Call holding, Conferencing, Call bars, speed dialling, Fixed number dialling, messaging services. Text to text, Text to e-mail.*				
26.	**SATCOM Systems (Various Bands)**	15	IN-> 250 IA- >25	IN-POC-PDNSO 011-23015216 IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Technologies. For fitment on various types of Ships (IN) & vehicles of AKASHTEER Cont Centres, man portable, low form factor, with min 2 GB data rate (IA).				
27.	**Cognitive Radio**	15 Years	IN-More than 250 IA- 450 to 500	IN-POC-Cmde (NS) 011-21410645 IA: 011-23018861
Broad Parameters/ Preferred Technologies. It should be a radio that can be programmed and configured dynamically. Equipment should automatically detect available channels in wireless spectrums, then accordingly change its transmission or reception parameters. Cognitive Radio must monitor its own performance continuously to deliver the required quality of service.				
28.	**Airborne SDRs**	10-15	IN-100 IA- 350	IN-POC-Cmde (NS) 011-21410645 IA: 011-23018861
Broad Parameters/ Preferred Technologies. Multi Channel multimode and modular secure Airborne SDRs in V/UHF and L band for various types of aircraft including Naval Fighter, MRMR, LRMR, Helicopters to meet secure voice and NCO requirements of the Naval Aircraft. The sets should provide secure voice, data and Mobile Adhoc Networking waveforms including AJ features compatible with existing IN SDRs and legacy radios. The Programme/ project will include integration with existing and future IN aircraft.				
29.	**Light Airborne SDRs**	10	IN- 50 IA-100	IN: POC-Cmde (NS) 011-21410645 IA: 011-23018861
Broad Parameters/ Preferred Technologies. Light airborne SDRs in the V/UHF and L band for lightweight helicopters and drones compatible with existing IN SDRs. The sets should provide secure voice, data and Mobile Adhoc Networking waveforms including AJ features compatible with existing IN SDRs. They should also have the capability to act as an airborne communication relay.				
30.	**AI/ML based ELINT Data Management System**	07	IN-05 IA-10 to 15	IN: 011-21410645 IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. The software should facilitate repository and management of EW database and analysis of offline EW data received from multiple sources using AI/ML algorithms. It should have all facilities necessary for generation and management of the data base, inclusive of facilities for entry merging, editing, correlation and listing of data. It should have multiple modules including predictions software based on generic formulae and calculations used in EW domain.				
31.	**Advanced EW (ELINT & COMINT) System**	15	IN-10 IA- 20 to 25	IN: 011-21410645 IA: 011-23018861
Broad Parameters/ Preferred Technologies. Availability of advance features to keep pace with available global technology, some of these are common antennae for low band (for both COMINT & ESM), transmission module band, SATCOM interception capability, GNSS Jamming and spoofing capability and spectrum modulating with small form factor for suitability for aircraft as well as small ships. **Remarks by DRDO – Under development**				
32.	**SATCOM (GEO Satellite)**	10 – 12	IN-01 IA-01	IN: 011-21410645 IA: 011-23018861
Broad Parameters/ Preferred Technologies. The requirement for seamless communication through GEO satellite for high throughput supportability in Ka and Ku bands supporting data rates of about 20 Mbps in Ku band and upto 100 Mbps in Ka band. This should include supportability for high throughput by means of high-power spot beams, preferably of 58 dBW or more. The satellite communication devices would be fitted on mobile platforms (air, surface, sub-surface) at sea and have versatility in few versions to also be operated in portable/ hand held version. Further, the terminals in Ka band (hand held, portable, fixed) including baseband would need to be developed as part of the project.				
33.	**Multi GNSS Jammer and Spoofer**	20 Yrs	IAF-12 IA-25 to 30	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/Preferred Technologies. Ground based vehicle mounted GPS Jammer operating against various satellite navigation constellations like GPS, GALILIO, GLONASS, BEIDU, IRNSS in L1/B1 and L2/B2 bands is required. System should be capable of jamming/ spoofing ground based/ airborne satellite navigation system from the range of 200 - 250 Kms. System should be self-sufficient for detecting Navigation signals. **Remarks by DRDO – Developed**				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
34.	**Drone/UAV Based Low Power Emulator/Jammer**	20 Yrs	IAF-1200 IA-25 to 30	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
	Broad Parameters/Preferred Technologies. Drone/UAV based solution to simulate as airborne threats in range of 0.5 - 06 GHz is required to deceive the enemy. The system should be able to radiate on pre-programmed frequencies with variable parameters to mimic the airborne threats. System should be cost effective and self-sufficient in terms deployment & power, etc. Weight of the system to be as less as possible in order to carry it on drone/ UAV.			
35.	**Drone/ UAV Based High Band Jammer**	20 Yrs	IAF-1200 IA-25 to 30	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/Preferred Technologies. Drone/UAV based EW system is required to provide jamming capability in the High Band i.e. 05 to 40 GHz. The system should be able to radiate on pre-programmed frequencies with variable parameters to mimic the airborne threats. System should be cost effective and self-sufficient in terms deployment & power, etc. Weight of the system to be as less as possible in order to carry it on drone/ UAV.				
36.	**UAV Based ELINT System with AI Enabled Analysis Capability and SATCOM Connectivity**	15-20 Yrs	IAF-100 IA-25 to 30	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
***Broad Parameters/Preferred Technologies**. UAV compatible compact AI enabled ELINT system capable of inline analysis and report generation with SATCOM connectivity. The required parameters are as follows:-* *(a) ELINT-0.03 to 40 Ghz.* *(b) COMINT-30 Mhz to 6 Ghz.* *(c) SATCOM data link between vehicle and base station.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
37.	**Compact/ Hand Held ELINT System**	15 Yrs	IAF-20 to 25 IA-40 to 50	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad parameter/Preferred Technologies. The compact/hand held ELINT system should be highly portable and can be a LMV mounted/ man pack system having the capability to scan the environment for RF signals from 70 MHz – 40 GHz. The system should have a minimum sensitivity of (-) 90 dBm. It should analyse the intercepted signal and provide the basic parameters viz. frequency, pulse width, PRI and DoA. This will help in accessing areas otherwise unapproachable by existing system vehicles.				
38.	**Technology upgrade in Ground Based Mobile ELINT System (GBMES)**	15 Yrs	IAF-07 IA > 05	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad parameter/Preferred Technologies. The required parameters are as follows:- *(a) Auto bit correlation/ Auto code identifier facility may be upgraded to w-code software (provided with GBMES) for identification and analysis of digital signal.* *(b) Frequency hopping monitoring facility may be provided as FH is used for secure communication during military operation.* *(c) Live RT audio monitoring facility from any receiver to control station may be provided for better utilization of COMINT monitor receiver.* *(d) Direction finding facility for COMINT may be provided as direction finding facility for same frequency band is available for radar emitter.* *(e) Replacement of DG sets with fuel cells Technologies to control pollution and save fuel expenditure.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
39.	**Future Portable Mobile Communication Solution for Ground Based Weapon System**	15	40 (Catering for Weapon System, Control Centre and redundancy) IA – 20-25	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/ Preferred Technologies. Next generation Military Communication Technology enabling High Output Mobile, Secure, Seamless, Redundant, Jam-proof Communication between Weapon System and Control Agency. Should be capable of secure communication as well as data exchange up to 100 Mbps employing SATCOM on AFNET (IAF) & ADN Architecture (IA). Communication sets should be compact with dimensions similar to a smart phone. Should have architecture capability to enable integration with higher/ lower echelons for data communication. Should be able to be employed up to an altitude 5kms. For secure and reliable communication between weapon system and control centres.				
40.	**Data link capability in cockpit using Software Defined Radio & Digital Aviation Solutions**	10	IAF-00 IA - 350	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
*Broad Parameters/ Preferred Technologies. The indigenous system should be capable of providing data service in flight for any equipment that needs real time updates. Electronic flight bag is capable of providing real time enroute weather and traffic information if data connectivity is established. Provision of indigenous digital aviation grade map database including high resolution terrain elevation data with near real time update. Multi format capability provided by software like feature manipulation engine. Automated precision calibration equipment for airfield and runway approach aids. (**for Utility Helicopter and Armed Helicopter**)*				
41.	**Active Noise Cancellation Headsets**	8-10	IAF-1500 IA-700	IAF: 011-23010231 (Ext 7883) IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. The device is required to facilitate clutter free R/T and intercom environment during the flying operations. The indigenous system must be compatible for receptacle connectivity with all the type of fixed wing aircraft. The system must be have the integration compatibility with helmet and oxygen mask, wherever applicable.				
42.	**Missile Approach Warning System (MAWS) and Directed Infra-Red Counter Measures (DIRCM) for transport and helicopters**	20 Yrs	IAF-200 IA-100	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/Preferred Technologies. Missile Approach Warning System and Directed Infra-Red Counter Measures for transport and helicopters are required for providing situational awareness of missile threat to pilots and DIRCM system acquire and track threat and activate pointing of laser towards the missile. This ensures generation of jamming laser energy.				
43.	**Dual IR Band and UV Based Imaging Seekers for MAN Portable AD System.**	15	IAF-100 Launchers & 500 Missiles IA-100 Launchers & 700 Missiles	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/ Preferred Technologies. Should have Imaging capability in near IR, Far IR and UV bands to identify aircraft, drones, helicopters and missiles. Should be able to track targets with max distance of 12 km. Should be able to distinguish between targets and flares based on imaging inputs. Multi band imaging seekers are to be employed in indigenously developed portable AD system. These will be effective against IR flares.				
44.	**PSS (Passive Surveillance System/ Multi Static/ Bi static)**	10	IAF-10-15 IA – 5-10	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/ Preferred Technologies. The system must be able to detect air targets using passive sensors like ESM sensors and PCL (Passive Coherent Locators). Combination of both technologies and common, command & control centre, display system must be available. The sensors and C2 must be mountable/ transportable on a vehicle. It must have detection capability upto 100 Km. The data must be portable into IACCS network. Vehicle should be all terrain capable, off road capable and the				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
equipment must be deployable at terrain upto 5000 Mtr AMSL. Maintenance requirements must be less. They must be capable of remote data operations. They must be quickly redeploy able. Must be Integratable with IACCS (IAF) and ***Akashteer network (IA).***				
Additional technologies under 'EW and Communications' may also be looked into				
45.	**Secure and captive Defence Cloud' for storage (SaaS)/ Application hosting (AaaS) as a Service.**			
46.	**An Integrated (Tri-Service) Data Collation and Management Framework' based on inter-connected Services Data-lakes concept.**			
EW				
47.	**Cognitive PFM generator for RWR, Jammers, etc**			
48.	**Photonic ELINT Sensors**			
49.	**Appl for fusion of ELINT, COMINT, IMINT, OSINT & Social Media intel (assisted by AI)**			
50.	**Ground/ Air/ Space base multi-band/ multi-purpose jammers.**			
51.	**Counter Drone mechanisms with common core technology**			
52.	**Realtime PFM generation and transfer to combat platforms**			
53.	**Miniaturised jammer (built into a Rifle butt)**			
54.	**Space Based Jammer**			
55.	**EMI/ EMC rest ranges**			
56.	**6G based Mobile comn**			
57.	**Laser based comn/ jammer**			
58.	**Cognitive Radios and Radars**			
59.	**EHF Comn**			
60.	**Expl of hollow-core/ ZBLAN fibre**			
SATCOM				
61.	**Realisation of Onboard Data Processing technology**		01	

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Onboard processing will equip faster turnaround times for obtaining the imagery by end users.				
62.	**Initiation of satellite-based hub-processing technology in space sector**		01	.
Broad Parameters/ Preferred Technologies. This will enable optimal utilisation of bandwidth and reduce the ground terminal size. This in turn would enable small to form factor receive terminals.				
SIMULATORS				
63.	**Spatial Disorientation Simulator**	15-20	Limited numbers	IA: 011-23018861 IN: 011-26771553
Broad Parameters/ Preferred Technologies. The SD simulator should have the facility for biological signal transmission and recording such as ECG, Blood Pressure, pulse and oxygen saturation with capability to select the desired parameters from preparation screen. The preparation screen should enable selection from a list of predefined SD effect. The simulator should have six-degrees of freedom. The movement should be smooth with sudden stop facility. Dual cockpit with pilot adjustable seats for fighter and helicopter. Chin window to be available for landing on platforms like an oil rig.				
64.	**Full Motion Simulator Level D**	30	More than 10	IA: 011-23018861 IN: 011-26771553
Broad Parameters/ Preferred Technologies. *(a) Capable of provide realistic training to pilots and weapon system operators for each type of helicopter (Advanced Light Helicopter Utility, Advanced Light Helicopter-Weapon Systems Integrated and future inductions.* *(b) Catered for one mother-station with 'Roll-on/ Roll-off' cockpit.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(c) Replicate flight envelope in terms of full-scale flight deck, cockpit environment, flight dynamics, systems operation in normal and emergency modes and operations with role specific mission equipment (eg. Electronic Optical Pod, Electronic Warfare Suite, Helmet Pointing System, armament, etc.). *(d) Simulate night and NVG training of pilots in varied terrain and weather conditions.* *(e) Six axis motion based high fidelity simulation of flight from start-up to switch-off enhanced by realistic visual & aural cues.* *(f) Should have crew stations, in addition to those for pilots, for instructor and observer.* *(g) Simulator should be capable of being networked to simulate joint maneouvres, air combat etc.* *(h) De-brief should be possible by means of replaying the sortie with full fidelity internally as well as from an external view.* *(j) Compliant with internationally laid down standards for Level D Full Flight Simulator.*				
		SPECIALISED VEHICLES		
65.	**Explosive Van**	10	More than 350	IA: 011-23018861 IN: 011-26771553
Broad Parameters/ Preferred Technologies. *(a) In-Service 5/7.5 MT 4x4 chassis to be basic platform for fabrication of Explosive Vans.* *(b) Should be able to carry maximum 6000 Kgs NEC (Net Explosive Content).* *(c) Fire Resisting Screen of minimum 18 SWG steel sheets lined with asbestos sheets of minimum approx thickness 6mm between screen & body of van.* *(d) Driver's cabin fitted & covered externally with 20 S.W.G / mild steel sheeting.* *(e) Vehicle to be rail transportable on broad gauge and ODC compliant.* *(f) Flash point of the fuel in diesel engine must not be less than 38^0 C.* *(g) The operating temperature range should be between (-) 15^0 C and (-) 5^0 C and max between 40^0 C and 45^0 C.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(h) Capable of operating in altitude upto 4500 meters above MSL.A - *Requirement of Robotic Handler Arm for handing of explosives.*				
AI/ ML/ BIG DATA				
66.	**AI Based Comprehensive Framework (Indigenous) for Security Operation Center**	5-10	IAF-3-5 IA-20 to 25	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad parameter/Preferred Technologies. The framework should be able to automatically prevent, detect and respond to cyber security incidents. The framework should be able to correlate logs from all available SOC tools such as Log collector, Security Information and Event Management (SIEM), EDR, Vulnerability assessment tool etc. The framework should be able to assess the behaviour of environment and any change occurring due to intrusion of threat. It should be able to assess the extent of damage to data and take remedial actions to contain it.				
67.	**Augmented Reality Helmet for Ground Troops**	IAF-30 IA-10	IAF-2000 IA-12000	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/Preferred Technologies. The helmets for troops with augmented reality display. The display to have AL/ML based overlay to show all friendly forces, buildings, terrain and vehicles. The display should work irrespective of illumination outside. The augmented reality data to be collaborated with other sensors linked with the system like – blue force awareness, IFF data of aircraft, vehicle location, perimeter security systems, camera systems etc. The eqpt will have AI/ML based overlay to show all friendly forces, building, terrain & vehicles. A system to provide identification capability to ground troops. Augmented reality needs to be att to existing ballistic Helmets and should have the capability of spiral development.				
UNMANNED AERIAL SYSTEMS/ COUNTER SYSTEM				
68.	**Supersonic Aerial Targets**	15-20	IN-10 IAF- 50-100 IA - 40-45	IN: 011-26771553 IAF: 011-23010231 (Ext 7883) IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/Preferred Technologies. The targets should be supersonic (>1.5M) and provide low RCS. It should have provision to mimic larger targets as required along with ability of replicating thermal and electronic signature. It should have a programmable flight profile including sea-skimming, with capability of AMDI/DMDI and link for control from surface or aerial platform at a LOS distance of 150 -200 km. It should have smoke, chaff and flare dispensing capability. It should be reusable for 10 cycles using ballistic parachute and inflating envelopes. It should be able to carry expendable tow targets/mimic payloads on pylons. It should have a max ceiling of not less than 8 km (IAF)/ 4 km (IA). **Remarks by DRDO – Under Development**				
69.	**Stealth UCAV**	20-25	IAF-40 - 50 IA-90 to 100	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/Preferred Technologies. The UCAV should be capable of supersonic speeds with super cruise incorporating low Observable stealth in all spectrums. It should be highly manoeuvrable and capable of sustaining instantaneous High-G loading. It should have provision to carry internal weapons of upto 4000 kg for both air to air and air to surface attack. It should have Manned –Unmanned teaming (MUMT) capability in the loyal wing man role. It should have a programmable flight profile including AI capable usage of avionics and cueing targeting systems using LPI radar/EO/IR/SWIR during offensive and defensive manoeuvres. There should be an electronic low latency, secure, encrypted Sat link for control in B-LOS and if in LOS distance of 300 km from surface or aerial platforms. It should have conformal defensive electronic/expendable stores capability. It should be able to carry out autonomous aerial refuelling. It should have a max ceiling of not less than 15 km. **Remarks by DRDO – Under development**				
70.	**Hard Kill Counter UAS System for neutralizing Swarm Drones**	10	IAF-150-175 IA- 45-50	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
Broad Parameters/ Preferred Technologies. All the sensor and neutralization systems must be mountable / transportable on a vehicle. Vehicle should have all wheel drive, off road capability and the equipment must be deployable at terrain upto 5000 Mtr AMSL. System with combination of sensors like RFD, AESA radar, EO &IR, Acoustic sensor etc. and combination of following neutralization systems:-				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(a) Net catcher drones systems. *(b) Radar guided Kamikaze neutralizer drones.* *(c) Radar guided munitions.* *(d) Laser DEW systems.* *(e) HPM systems.* **Remarks by DRDO – Under Development**				
Additional technologies under 'Unmanned Aerial Systems/ Counter System' may also be looked into.				
71.	**Unmanned/ Autonomous Platforms**			
SATELLITE BASED APPLICATIONS				
72.	**CBRN Threat detection and Monitoring Sensors for VLEO Bus**	5 - 10	IAF-2-5	IAF: 011-23010231 (Ext 7883) IA: 011-23018861
	(a) VELO Bus – for radiation detection		IA-02 to 04	
	(b) Drones/ Quadcopter – for chemical & biological threat detection		IA -15 to 20	

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters. Space based Ballistic Missile Defence (BMD) is the capability for early warning, detection and destruction of ICBMs along with location of launch points and prediction of impact points. Space based sensors will act as triggering layer for early detection of ballistic missiles. In addition, specific payloads for detection and identification of CBRN activities and their sources to be included. Hence, VLEO based system be made for radiation detection drones/ quadcopters for Chemical and Biological Threat detection respectively.				
PRACTICE TARGETS				
73.	**ATI (Air Target Imitator)**	07	200	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. ATI is a rocket projectile used as an aerial target for Infra Red (IR) homing Surface to Air Missiles (SAMs). The system should be capable of being locked on by in service IR homing SAMs & should be capable to be launched from a launcher fitted on 5/7.5 Ton in service class of vehicle. The maximum speed of the system during flight should be ≥180 meter/second with minimum flight time of 15 seconds and duration of IR source for 15 seconds.				
74.	**APTA (Advance PTA)**	Minimum 10 launch Recovery cycles or 10 Yrs shelf life	100	IA: 011-23018861 IN: 011-26771553
Broad Parameters/ Preferred Technologies. Adv PTA is a target equipment to be used for exercises/ practice firing with or without tow bodies. It should be a booster launched, reusable airborne vehicle, deploying expendable towed target systems and deployable over land or sea. It should have a Sea Recovery & Land Recovery Version. The max operational altitude for land recovery version should not be less than 8 km for clean configuration & 4 km for tow configuration.				
SUPPORT AND SMALL ARMS				
75.	**Assault Rifle**	10	More than 2,50,000	IA: 011-23018861 IN: 011-26771553

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. 7.62 X 51 mm Calibre. Effective range of 500 m. Weight less than 4 Kg. Picatinny rails for mounting the sights. **Remarks by DRDO – Developed**				
76.	**Protective Carbine**	10	More than 2,30,000	IN: 011-26771553
Broad Parameters/ Preferred Technologies. 5.56 X 30 mm Calibre. Effective range of 100 m. Weight less than 3 Kg. Picatinny rails for mounting the sights. **Remarks by DRDO – Developed**				
SHIPS/ CRAFT				
Ships				
77.	**Directed Energy Weapon (DEW)**	20	IN-2 DEW in lieu of 2 AK 630 when developed IA- 18 Systems	IN: 011-26771553 IA: 011-23018861
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised.				
78.	**New Water Jet Fast Attack Crafts (NWJFACs)**	20	IN-21 IA-10-15	IN: 011-26886427 IA: 011-23018861
Broad Parameters/ Preferred Technologies. The NWJFACs would be capable to carry out local naval defence, seawards defence of ports and offshore installations. The platforms are envisaged to have a length of approx. 50m with a draft of not more than 2.1m and displacement close to 320 tons. The propulsion package is envisaged to be with three diesel engines with independent RGs and Waterjets. Three DAs of suitable capacity are envisaged onboard. The maximum speed is envisaged to be more than 35 knots with maximum sustainable speed of more than 25 Knots at maximum tonnage at deep displacement. The platforms are envisaged to be equipped close range weapons. COTS NAV radar (I Band) with IBS, AIS, DGPS,CMS, SDRs, ACCS, Link II, SATCOMs with GMDSS suite, a light weight ESM system capable of detecting emitters in the frequency range from 0.1 to 18 GHz or better.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
MISSILES AND SYSTEMS				
79.	**Universal Launcher**	30	Not less than 100	IA: 011-23018861 IN: 011-26771553 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. Universal Launcher will enable launch of multiple types missiles from same platform (by land, sea or air)				
80.	**Scramjet Propulsion for Hypersonic Missiles**	30	Not less than 500	IA: 011-23018861 IN: 011-26771553 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies.				
81.	**Surface to Surface Missile**	15	IN-200 IA- To be decided later	IN: 011-26771553 IA: 011-23018861
Broad Parameters/ Preferred Technologies. The missile should be not more than 1 Ton in weight. It should have a range of more than 150 km for anti-ship role and land attack capability. **Remarks by DRDO – Under development**				
METEOROLOGY				
82.	**Lightning Detection System (LDS)**	IAF-10 IA- 15-20	IAF-85-90 IA>25	IA: 011-23018861 IAF: 011-23010231 (Ext 7883)
Broad Parameters / Preferred Technologies. A 'Lightning Detection System' consists of a network of sensors that measures the electromagnetic radiation emitted by lightning from convective clouds. This data is used to calculate the exact discharge location, polarity and additional parameters of lightning, resulting in detailed and precise lightning strike location. The data obtained is useful for nowcasting / forecasting of hazardous weather associated with convective clouds. LDS would enhance Aerospace safety by providing vital inputs for issuing weather advisory. The detection range should be more than 1000kms.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
SPACE & COMMUNICATION				
Down Stream Applications				
83.	**Development of Satellite based IoT**		02 (Terminals)	IA: 011-23018861 IN: 011-23010238 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. This technology would enable multiple use cases like monitoring to troop/ convoy movement, logistics management, remote monitoring and control of installation and smart cantonments etc.				
SSA				
84.	**High Aperture Optical Telescopes (Svl/ Tracking)**		01	IA: 011-23018861 IN: 011-23010238 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. This technology will enable to monitor space debris and track our own space assets for space safety.				
85.	**Development of space-based telescopes/ EO/ IR sensors for SSA in LEO for update of Area of Interest**	-	05	IA: 011-23018861 IN: 011-23010238 IAF: 011-23010231 (Ext 7883)
Broad Parameters/ Preferred Technologies. These telescopes would be used for ensuring Space Traffic Management.				
86.	**Development of Space based LASER ranging systems -02 Nos**		01	IN: 011-23010238
Broad Parameters/ Preferred Technologies. This technology would be utilised for precise determination of position of space objects by conducting LASER ranging to ascertain the orbital position to avoid any accidental collisions in space.				
Additional technologies under 'Space & Communication' may also be looked into.				
87.	**A Space-Ground Integrated Information Network (SGIIN) for conduct of effective multi-domain ops (MDO)**			
88.	**Indigenous QKD, QRNG & PQC protocols**			

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
89.	**Establishment of exclusive Defence Quantum Comn Network**			
90.	**Quantum based EW capb**			
91.	**Quantum Computing**			
92.	**Quantum sensors for jam resistant PNT along with celestial navigation**			
93.	**R&D in V/U Bands wrt Rada Imaging Reconnaissance Satellite (RISAT)**			
94.	**Space based SDRs**			
95.	**DAMA Satl**			
96.	**S-Band SATCOM eqpt**			
97.	**Laser dazzler for ae/ spacecraft**			
98.	**C-SAR PRB/ ELT**			
	IT/ CYBER SECURITY TOOLS			
99.	**Indigenous Web-based vulnerability assessment tool**	5 years (With inherent build support for periodic updates)	20 license keys (Capability to support 200 subscribers concurrently)	**Joint**
Broad Parameters/ Preferred Technologies. A web-based search platform for assessing potential attack surface for Internet connected devices (Internet of Things/ Industrial Internet of Things (IoT/IIoT), Internet-connected industrial control systems & platforms). *(a) The application should provide an indigenous alternative to COTS from Foreign Vendors, with premium content restricted and shared with relevant agencies.* *(b) It will facilitate collation of vulnerabilities of Critical Infra aiding own vulnerability assessment.*				
100.	**Cyber Range for training**	5 years (With inherent build support for periodic updates)	20 license keys (Capability to support 200 subscribers concurrently)	**Joint**
Broad Parameters/ Preferred Technologies. A cloud based Cyber Range with various constructs (current webservers with demo applications, Email Server, VOIP, etc, AD with clients, etc) for Vulnerability Assessment and Pentesting training.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
(a) Cloud based solution for access to relevant agencies for Cyber R&D. *(b) It will aid training of Blue and Red teams and develop expertise. Commonality of Range will avoid redundant setups and facilitate Cyber R&D.*				
101.	**Indigenous Code Analysis Tool**	5 years (With inherent build support for periodic updates)	20 license keys	**Joint**
Broad Parameters/ Preferred Technologies. Framework for analysis of source code of various web and mobile applications for security misconfigurations and developmental errors. Indigenous solutions will obviate necessity for taking MII waiver, as most of existing commercially available products are of import nature.				
102.	**Indigenous Reverse engineering toolkit**	5 years (With inherent build support for periodic updates)	20 license keys	
Broad Parameters/ Preferred Technologies. Application to decompile a malware to fix attribution of any malware attack on own cyber assets. The solution should be capable of reverse engineering executables, compiled binaries etc. with disassemble & decompile abilities. Indigenous solutions will obviate necessity for taking MII waiver, as most of existing commercially available products are of import nature.				
103.	**Indigenous Disk Imaging/ Cloning Tool**	5 year (With inherent build support for periodic update)	20 license keys	
Broad Parameters/ Preferred Technologies. Tools should have capability to Image/Clone Hard Disk, SSD, pen drive, SD card Windows & Mac OS. It should have the ability to detect partitions / bit locker/ Veracrypt/ Truecrypt etc and capability to read DCO & HPA area of the destination drive. Indigenous solutions will obviate necessity for taking MII waiver, as most of existing commercially available products are of import nature.				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
104.	**Indigenous Forensic Image Analysis Tool**	5 year (With inherent build support for periodic update)	20 license keys	
Broad Parameters/ Preferred Technologies. The toll should support analysis of computer/ Laptops (Hard disk, SSD) and other media and support multiple decryption of various encrypted partition (Vera Crpt and Bit locker). It should have the capability of optical character recognition command and able to investigate windows registry, e-mail, network details, deleted data and carving data. It should include system support to analyse VMware, Virtual PC image format. Indigenous solutions will obviate necessity for taking MII waiver, as most of existing commercially available products are of import nature.				
105.	**Indigenous Mobile Forensics Tool**	5 year (With inherent build support for periodic update)	20 license keys	
Broad Parameters/ Preferred Technologies. The tool should support analysis of computer/ Laptops (Hard disk, SSD) and other media and support multiple decryption of various encrypted partition (Vera Crypt and Bit locker). It should have the capability of optical character recognition command and able to investigate windows registry, e-mail, network details, deleted data and carving data. It should include system support to analyse VMware, Virtual PC image format. Indigenous solutions will obviate necessity for taking MII waiver, as most of existing commercially available products are of import nature.				
106.	**Indigenous Mobile Forensics Tool**	5 year (With inherent build support for periodic update)	20 license keys	
Broad Parameters/ Preferred Technologies. Tool should have the capability of physical, file system and logical extraction for different mobile devices (Android, iOS, Symbian, Blackberry, Windows, Chinese chipset based phones etc), drones, cloning of SIM card, GPS devices. It should retract a wide range of data e.g., Call logs, Contacts, Chat, e-mails etc and should allow extraction of Cloud Data source tokens. Indigenous solutions will obviate necessity for taking MII waiver, as most of existing commercially available products are of import nature.				
107.	**Indigenous Deep Fake detection Tool**	5 years (With inherent build support for periodic updates)	20 license keys	

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Tool should have the capability to detect audio and video deep fakes and A/V manipulations. Indigenous solutions will provide capability to detect deep fakes in near real time and check spread of fake narrative.				
Additional technologies under 'IT/ Cyber Security Tools' may also be looked into				
108.	**Securing endpoint/ network/ Data Centre devices**			
109.	**Securing data tfr over public networks**			
110.	**Provisioning of kernel level security for both wired/ wireless (i.e. mobile/ static) devices**			
111.	**Secure and generative search engine**			
112.	**Secure handling of spare and additional assets/ sensors**			
113.	**EDR (Endpoint Detection and Response**			
114.	**Blockchain based network**			
115.	**Internet of Military Things/ Battlefield Thing (IoMT/ IoBT)**			
MISCELLANEOUS				
116.	**Counter Measure Dispensing System/Directional Infra Red Counter Measure System**	15	More than 200	IA: 011-23018861 IN: 011-23011668
Broad Parameters/ Preferred Technologies. Counter Measures System for all aircraft such as Counter Measure Dispensing System (CMDS), Directional Infra Red Counter Measures (DIRCM) system and towed decoy system for self defence for fighter, helicopters and MR aircraft against active radar and passive IR guided anti- aircraft missiles.				
117.	**Demil Plant for Disposal of UNSV Ammunition**	30 Yrs	13000 MT/Yr	IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. Demil of unsv amn is reqd to be carried out in order to enable its secure & environment safe disposal. The guidelines of Central Pollution Control Borad too make it mandatory for concerned agencies to arrange infrastructure, facilities & processes to segregate by- products like plastics, metals, explosives etc before it sfinal discard. Indian army is looking forward to collaborate with industry partners for suitable solutions for the same. At present IA disposal UNSV amn by periodical manner ie either by demolition or burning. Approx 13000 MT on an average is disposed every yr.				
118.	**Upper Air Sounding System (UASS)**	10 Yrs extendable up to 12 years with upgrades	UASS > 50 Systems More than 20,000 Radiosonde per year	IN: 011-21410476
Broad Parameters/ Preferred Technologies. Broad Parameters/ Technologies. Upper Air Sounding System (UASS) is used to measure the upper atmospheric weather parameters viz., Pressure, Temperature, Humidity, wind speed and wind direction. Each system should comprise of Ground Receiving Station (permanent item), 200 number Radiosondes (consumables) and 200 number 250 gm balloons. The consumable nature items are required to be stowed in an air conditioned room.				
Project to be included under a new category of Unmanned Systems				
119.	**Compact Autonomous Craft All Domain Effects (CASCADE) – Anti Submarine Warfare**	15	20	IN: 011 – 26771553
Broad Parameters/ Preferred Technologies. CASCADE should be an Autonomous Surface Vessel (ASV) of length between 15-25m with towed array/ thin line sonar and torpedo tubes for submarine detection, classification and neutralisation. CASCADE is intended to be operated from shore based Control Station in autonomous, remote or minimally manned mode.				
120.	**Laser Ordnance Disposal Systems (LORDS)**	10	IN-02 IA-10 to 15	IN: 011-20867293 IA: 011-23018861

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
Broad Parameters/ Preferred Technologies. LORDS is to cater for disposal of Naval explosive stores which have been declared obsolete/ unserviceable for further use. *(a) Warhead of missiles, Torpedoes, Rockets, Mines etc weighing from 1 kg to 700 kgs (Net Explosive Content) and 1000 Lbs.* *(b) Small arms ammunition of caliber ranging from 5.56 to 20 mm.* *(c) Naval Gun Ammunition from 20 mm to 130 mm caliber.* *(d) Propellant of various sizes (pellet, grains sticks etc).* *(e) Rockets I chaff ammunition of caliber ranging from 100 to 140 mm.* *(f) System should be capable of delivering the output materials (scrap) from the disposal process to segregate separate its basic components like brass, steel. Aluminum etc.* **Remarks by DRDO – Developed**				
121.	**Anti-Drone FCS mounted on assault rifle (AK-203, INSAS 5.56 MM, SIG-716)**	10	IN- 1000 IA – 200-250	IN: 011-20867293 IA: 011-23018861
Broad Parameters/ Preferred Technologies *(a) The FCS should be compatible with AK-203, INSAS 5.56 MM, SIG-7/6 assault rifles.* *(b) Capable of locking into slow moving low flying drone targets.* *(c) Should have in limit algorithm for accurate firing from assault rifle similar to Smash 2000 system developed by M/s Smart-shooter, Israel.*				
122.	**Self-Contained Underwater Air Breathing Apparatus (SCUBA)**	25	IN- >400 IA – 100-150	IN: 011-20862612 IA: 011-23018861
Broad Parameters/ Preferred Technologies. Self-Contained Underwater Air Breathing Apparatus (SCUBA) is used to enable a diver to dive up to depths of 55 mts. It has an inbuilt capacity to regulate air pressure in accordance with the depth of dive. The facemask should be with breathing valve assembly and have a positive pressure inside. The mask should have provision to integrate with 'Underwater Communication System' (DUCS as well as WUCS. The Diving set should be provisioned with suitable harness, pressure compensated regulator unit with a provision for safe operations in extreme cold climates, Buoyancy Compensating Device				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
and provision of an additional on-demand mouth piece so as to enable diver to breathe in case of main mask failure. The entire Apparatus should comply to following current International Standards: - *(a) Current MILSEC/ HSE/ NATO equipment performance standards.* *(b) Certification as per ISI/ ISO/ Lloyds/ EN250/ DNV or equivalent Standards for HP cylinders, rubberised HP/ LP pipes, Buoyancy Jacket and other materials. Various other requisite parameters are as follows: -* *(i) Working pressure - 300 Bars, testing Pressure -450 Bars* *(ii) Pressure compensated -at least up to 75 m depth* *(iii) Nominal capacity of twin cylinders – not less than 11 Litres* *(iv) Weight on surface – shall not be more than 22 Kg* *(v) Minimum air capacity after charging- Minimum 3300 Litres.* *(vi) Weight in water – not more than 3.5 Kg* *Additionally, life time support from manufacturer is desired including spares and accessories*				
PNT				
123.	**Development of multi-GNSS handheld receivers**	-	01	
Broad Parameters/ Preferred Technologies. *This would enhance the geo location accuracy and would the problem of ionospheric scintillation in single band GNSS receivers.*				
124.	**Development and further integration of platform-based receivers by SHQs**	-	01	
Broad Parameters/ Preferred Technologies. *This technology would be help to equip high dynamic platform with indigenous navigation capabilities to derive their PNT information.*				
125.	**Non Line of Sight (NLOS) ATGM** (Semi Active Laser Seeker)	-	-	-
Broad Parameters/ Preferred Technologies. *All the present ATGMs are fired in Line of Sight (LOS). However, in some terrains where there is vegetation, the gunner may not get LOS. In such cases NLOS ATGMs serve the purpose. BDL has been developing a cost effective Semi Active Laser seeker based ATGM for ICVs.*				

Sl No	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Single Point of Contact (SPOC)
126.	**Drone Delivered Bombs**	-	-	-
Broad Parameters/ Preferred Technologies. Drone-delivered unguided bombs refer to explosive devices dropped from drones. BDL has developed various versions of bombs including 1kg. 3.5kg and 5kg.				
127.	**Laser Beam rider Guided (LBRG) ATGM**	-	-	-
Broad Parameters/ Preferred Technologies. LBRG ATGM Provides high-precision targeting by guiding missiles using a laser beam reflected from the target, offering resistance to electronic jamming. BDL has been developing LBRG ATGM to augment the capabilities of Mechanized Infantry with variants of cost effective ATGMs.				
128.	**VSHORAD SYSTEMS**	-	-	-
Broad Parameters/ Preferred Technologies. VSHORAD SYSTEMS are essential for protecting our forces and maintaining air defence readiness. They can quickly target and neutralize drones, helicopters, low flying aircraft, and even loitering munitions.				

PROJECTS UNDERTAKEN BY GoI/ MoD

Make / iDEX / Srijan Portal

1. The '**Make**' Categories aim to achieve the objective of self-reliance by involving greater participation of Indian industrial eco-system including private sector through the following procedures:-

(a) **Make-I (Government Funded)**. Projects involving design and development of equipment, systems, major platforms or upgrades thereof by the industry. For Projects under Make-I sub-category, MoD will provide financial support upto **70%** of prototype development cost or maximum ₹ 250 crores per Development Agency (DA). Funding would be released in a phased manner based on the progress of the scheme, as per terms agreed between MoD and the DA(s). However, the final percentage or upper limit of financial support to be provided may vary from case to case and would be dependent upon nature of the project and the fund support sought by the selected DAs for development of prototype.

(b) **Make-II (Industry Funded)**. This would include design and development and innovative solutions by Indian vendor, for which no Government funding will be provided. In Make-II, where solutions have been offered even by a single individual or a firm as a Suo-Moto proposal, the cases would be progressed as a Resultant Single Vendor. However, SHQ should seek for multivendor options in such cases, if feasible, before progressing the case as Single Vendor Case.

(c) **Make-III.** This although would not be designed/ developed indigenously, but can be manufactured in India as import substitution for product support of weapon systems/equipment held in the inventory of the Services. Indian firms may manufacture these either in collaboration or with ToT from foreign OEMs. In this category, an Indian vendor can enter into a JV with OEM.

(d) **Present Status**. A total of 151 projects are being progressed by the Services under Make-I/II/III. (HQ IDS- 12, Army - 45, Navy - 41 and IAF - 53). Out of these, 63 have been accorded AoN and four projects have been contracted so far.

(e) **Links to Services 'Make' Projects**

(i) **Army**. indianarmy.nic.in/content2/adb/development-routes

(ii) **Navy**. https://www.makeinindiadefence.gov.in

(iii) **Air Force**. www.makeindiadefence.gov.in/projects/projectlist

2. **iDEX Brief**. The iDEX initiative was launched by the Hon'ble PM in April 2018. iDEX aims to achieve self-reliance and foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups, individual innovators, R&D institutes and academia. iDEX/ DIO launches Defence India Start-up Challenge (DISC) with problem statements from Armed Forces, DPSUs & OFB. After rigorous evaluation of the applications, winners are identified. iDEX has partnered with leading incubators in the country to provide handholding, technical support and guidance to the winners of iDEX challenges. iDEX will be funded and managed by a 'Defence Innovation Organisation (DIO)' which has been formed as a 'not for profit' company as per Section 8 of the companies Act 2013 for this purpose by the two founder members i.e. DPSUs–HAL & BEL. DIO acts as a bridge between the requirements of the Armed Forces and the solution providers. DIO provides high level policy guidance to iDEX framework.

(a) **Present Status**. So far, a total of 416 plus problem statements have been posed by all users with DDP/ MoD. Out of these active challenges, as many as 331 are sponsored by the Armed Forces (HQ IDS - 20, Army - 74, Navy - 167, IAF - 64 and ICG – 06 projects). About 162.00 Cr grant has been disbursed under iDEX scheme so far. Out of these, AON has been granted for 32 projects and procurement contract for 19 items has been placed.

(b) **Link to Projects under 'iDEX'**: https://idex.gov.in/challenges

3. **Srijan Portal**. A drive for identification and indigenisation & innovation of all high-value complex spares through domestic Indian industry is underway. Towards this, the online web portal – 'Srijan' is being effectively utilised. Recently, the Government has allocated Rs 92,088 crore during the current FY 2024-25 for sustenance & operational readiness, which is 48% higher than the budgetary allocation of FY 2022-23.

(a) **Link to 'Srijan Portal':** https://srijandefence.gov.in